



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

January 18, 1994

Reply To
Attn Of: HW-104

CERTIFIED MAIL -- RETURN RECEIPT REQUESTED

L. M. Babich III
Environmental Affairs Manager
Boeing Commercial Airplane Group
P.O. Box 3707
Seattle, Washington 98124-2207

Re: RCRA Docket No. 1092-01-22-3008(h)
Facility ID NO. WAD 00925 6819

Dear Mr. Babich:

Enclosed is the referenced Administrative Order on Consent for corrective action at The Boeing Company's Plant II facility on East Marginal Way in Seattle. Subsequent to your returning the Order with The Boeing Company's signature, it was executed by signature of the Director of the Hazardous Waste Division.

Thank you for the ongoing cooperation of The Boeing Company in negotiating this Order. We anticipate continued cooperation in its implementation.

Sincerely,

Michael F. Gearheard, Chief
Waste Management Branch

Enclosure

cc: Hideo Fujita, Washington Department of Ecology, Northwest
Regional Office (with enclosure)

Administrative Order on Consent
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- C. QUALITY ASSURANCE
- D. DATA MANAGEMENT

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7 UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
8 REGION 10

9 IN THE MATTER OF:)

10 THE BOEING COMPANY)

11 WAD 00925 6819)

12)
13 RESPONDENT)
14)
15)
16)

ADMINISTRATIVE ORDER ON
CONSENT

U.S. EPA Docket No.
1092-01-22-3008(h)

Proceeding under Section
3008(h) of the Resource
Conservation and Recovery
Act, as amended,
42 U.S.C. § 6928(h).

17
18 I. JURISDICTION

19 1.1. This Administrative Order on Consent ("Order") is
20 issued pursuant to the authority vested in the Administrator of
21 the United States Environmental Protection Agency (EPA) by
22 Section 3008(h) of the Solid Waste Disposal Act, commonly
23 referred to as the Resource Conservation and Recovery Act of 1976
24 ("RCRA"), as amended, 42 U.S.C. § 6928(h). The authority vested
25 in the Administrator to issue orders under Section 3008(h) of
26 RCRA has been delegated to the Regional Administrators by EPA
27 Delegation Nos. 8-31 and 8-32 dated April 16, 1985, and further
28 BOEING PLANT 2 - ADMINISTRATIVE ORDER ON CONSENT - Page 1

1 delegated by the Regional Administrator for Region 10 to the
2 Director, Hazardous Waste Division by redelegation order R10
3 1281.7.

4 1.2. This Order is issued to The Boeing Company
5 ("Respondent"), the owner/operator of Boeing Plant II (the
6 "Facility") located at 7755 East Marginal Way South in Seattle,
7 Washington. The Facility borders on the Duwamish Waterway to the
8 west, Webster Street and property owned by Crowley Marine
9 Corporation to the north, excluding public streets and ways, the
10 AIRCO Products plant and East Marginal Way to the east, and the
11 Jorgenson Forge Corporation to the south (see Figure 1).
12 Respondent consents to and agrees not to contest EPA's
13 jurisdiction to issue this Order or to enforce its terms.
14 Further, Respondent will not contest EPA's jurisdiction to:
15 compel compliance with this Order in any subsequent enforcement
16 proceedings, either administrative or judicial; require
17 Respondent's full or interim compliance with the terms of this
18 Order; or impose sanctions for violations of this Order in
19 accordance with applicable law and the terms of this Order.
20

21 II. DEFINITIONS

22 2.1. Unless otherwise expressly provided herein, terms used
23 in this Order which are defined in RCRA or in regulations
24 promulgated under RCRA, or in Section 101 of the Comprehensive
25 Environmental Response, Compensation and Liability Act
26 ("CERCLA"), as amended, 42 U.S.C. § 9601, shall have the meaning
27 assigned to them under RCRA, regulations promulgated thereunder,
28

1 or CERCLA. To the extent that a RCRA and a CERCLA definition are
2 inconsistent, the RCRA definition shall control.

3 2.2. Additional work shall mean any activity or requirement
4 not expressly covered by this Order, including its incorporated
5 attachments and EPA approved submittals, but determined by EPA to
6 be necessary to meet the objectives of this Order.

7 2.3. Administrative Record shall mean the record compiled
8 and maintained by EPA relative to this Order as described in
9 "Guidance on Administrative Records for RCRA 3008(h) Actions",
10 OSWER Directive 9940.4, July 6, 1989.

11 2.4. Area of Concern shall mean any area of the Facility
12 where a release to the environment of hazardous waste or
13 hazardous constituents has occurred, is suspected to have
14 occurred, or may occur.

15 2.5. Corrective measure shall mean any measure or actions to
16 control, prevent, or mitigate the release or potential release of
17 hazardous waste or hazardous constituents into the environment,
18 selected by EPA for the Facility.

19 2.6. Corrective Measure Implementation ("CMI") shall mean
20 those activities necessary to initiate, complete, monitor, and/or
21 maintain corrective measures EPA selects to protect human health
22 and/or the environment from the release or potential release of
23 hazardous waste or hazardous constituents into the environment
24 from the Facility. CMI requirements are detailed in the CMI
25 Scope of Work included as Attachment B.

26 2.7. Corrective Measure Study ("CMS") shall mean the
27 investigation and evaluation of potential corrective measures

1 which will protect human health and/or the environment from the
2 release or potential release of hazardous wastes, or hazardous
3 constituents, into the environment from the Facility. CMS
4 requirements are detailed in the CMS Scope of Work included as
5 Attachment A.

6 2.8. Data Quality Objectives shall mean qualitative or
7 quantitative statements describing the quality of data needed to
8 support a specific environmental decision or action.

9 2.9. Day shall always mean a calendar day. In computing any
10 period of time under this Order, if the last day falls on a
11 Saturday, Sunday, or federal holiday, the period shall run until
12 the end of the next day which is not a Saturday, Sunday, or
13 federal holiday. Any time period scheduled to begin on the
14 occurrence of an act or event shall begin on the day after the
15 act or event.

16 2.10. Hazardous Constituents shall mean those constituents
17 listed in Appendix VIII to 40 C.F.R. Part 261.

18 2.11. Interim measures ("IM") shall mean action initiated in
19 advance of approval of final corrective measures to stabilize or
20 otherwise control or eliminate the release or potential release
21 of hazardous waste or hazardous constituents at or from the
22 Facility.

23 2.12. Order shall mean the text of this Order and all
24 Attachments to this Order, and all submittals required by this
25 Order after they are approved in writing by EPA (except periodic
26 progress reports, Health and Safety Plans, and Quality Assurance
27 Project Plans), all of which are incorporated into this Order by

1 this reference and are enforceable parts of this Order as if set
2 out at length in this Order.

3 2.13. Receptors shall mean those humans, animals, or plants
4 and their habitats which are or may receive or be affected by
5 releases of hazardous waste or hazardous constituents at or from
6 the Facility.

7 2.14. RCRA Facility Investigation ("RFI") shall mean the
8 investigation and characterization of the source(s), nature,
9 extent, direction, rate, movement, and concentration of the
10 hazardous waste and hazardous constituents that have been or are
11 likely to be released into the environment at or from the
12 Facility.

13 2.15. Solid Waste Management Unit ("SWMU") shall mean any
14 discernible unit at which solid wastes have been placed at any
15 time. Such units include any area of or at the Facility where
16 solid waste has been routinely and/or systematically treated,
17 stored, disposed of, or managed.

18 2.16. Stabilization shall mean the techniques intended to
19 control or abate threats to human health and/or the environment,
20 and to prevent or minimize the spread of contamination while
21 long-term corrective action alternatives are evaluated.

22 2.17. Submittal shall include any workplan, report, progress
23 report, or any other written document Respondent is required to
24 submit to EPA pursuant to this Order .

25 2.18. Work shall mean any activity Respondent must perform
26 to comply with this Order.

1 III. STATEMENT OF PURPOSE

2 The objectives of this Order are to protect human health and
3 the environment as follows:

4 3.1. Respondent's continued implementation of corrective
5 action at and for the Facility in a manner acceptable to EPA,
6 including all investigatory and cleanup phases.

7 3.2. Respondent's continued implementation of interim
8 measures.

9 3.3. Respondent's completion of a RCRA Facility
10 Investigation ("RFI") acceptable to EPA.

11 3.4. Respondent's performance of a Corrective Measure Study
12 ("CMS") acceptable to EPA.

13 3.5. Respondent's performance of Corrective Measure
14 Implementation ("CMI") acceptable to EPA.

15 3.6. Respondent's performance of any other activities
16 necessary to correct or evaluate actual or potential threats to
17 human health and/or the environment resulting from the release or
18 potential release of hazardous waste or hazardous constituents at
19 or from the Facility.
20

21 IV. PARTIES BOUND

22 4.1. This Order shall apply to and be binding upon EPA and
23 Respondent, its assigns, successors, receivers and trustees.
24 Respondent shall be responsible for ensuring that all persons
25 working on its behalf, including any contractors and consultants,
26 shall comply with this Order.
27

1 4.2. No change in ownership of the Facility or in
2 Respondent's form of business organization will in any way alter
3 Respondent's responsibilities under this Order.

4 4.3. Respondent shall provide a copy of this Order to all
5 contractors, laboratories, and consultants retained to conduct or
6 monitor any portion of the Work within fourteen (14) days after
7 the issuance of this Order or the retention of such person(s),
8 whichever occurs later, and shall condition all such contracts on
9 compliance with this Order.

10 4.4. Respondent shall give written notice of this Order to
11 any successor in interest prior to transfer of ownership or
12 operation of the Facility, or a portion thereof, and shall notify
13 EPA within thirty (30) days prior to any such transfer.

14 4.5. Respondent agrees to perform all Work required by this
15 Order, including all portions of this Order incorporated by
16 reference. Respondent waives all rights to a hearing on the
17 issuance, validity, or enforceability of this Order, pursuant to
18 Section 3008(b) of RCRA, 42 U.S.C. § 6928(b), 40 C.F.R. Part 24.

19 4.6. Where this Order creates duties upon Respondent, any
20 directory language, including the words "will," or "shall", when
21 used in reference to any action to be taken by EPA, is intended
22 only, and shall be interpreted, as condition(s) precedent to
23 Respondent's duty(s), and not as any duty of EPA to act, or to
24 act within a specified time period.

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5.2. Respondent engaged in treatment, storage, or disposal of hazardous waste at the Facility subject to interim status requirements 40 C.F.R. Part 265 and WAC 173-303-400.

5.3. Respondent owned and/or operated the Facility as a hazardous waste management facility on or after November 19, 1980, the date which subjects facilities to RCRA permitting requirements, including interim status requirements, pursuant to Section 3005 of RCRA, 42 U.S.C. § 6925, and implementing regulations thereunder.

5.5. In its Part A (interim status) permit application,

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1 dated November 18, 1980, Respondent identified itself as handling
2 and storing drums or tanks of the following hazardous waste in
3 the interim status units at the Facility: F001, F002, F003,
4 F005, F007, F009, F011, and D001.

5 5.6. On October 22, 1981, EPA issued a determination to
6 Respondent that as owner and operator of the Facility, Respondent
7 had met the requirements of Section 3005(e) of RCRA for interim
8 status. On September 21, 1982, Respondent submitted a Part B
9 hazardous waste permit application to EPA. This permit
10 application listed six areas where hazardous wastes were staged
11 for disposal offsite. The wastes staged in these areas were
12 specifically:

13 Area 1 - Flammable materials, corrosive and oxidizing
14 materials, and poisons

15 Area 2 - Oils and oily liquids

16 Area 3 - Waste acids

17 Area 4 - Chrome bearing rinse waters

18 Area 5 - Cleaning solvents

19 Area 6 - Waste cyanide

20 On June 9, 1983, EPA forwarded a draft hazardous waste permit to
21 Respondent for operation of a hazardous waste storage facility at
22 the Facility. A final Part B permit has not yet been issued.

23 Respondent has submitted closure plans to the Washington State
24 Department of Ecology ("Ecology") for all remaining interim
25 status units. Respondent notified Ecology and EPA on June 7,
26 1993 that all TSD operations at the Facility had been
27 discontinued as of June 1, 1993.

1 5.7. Respondent manufactures aluminum alloy, steel alloy,
2 and titanium alloy parts at the Facility for airplanes assembled
3 elsewhere in northwestern Washington. The Facility occupies 107
4 contiguous acres adjacent to the Duwamish Waterway. The Facility
5 was built, in part, on fill generated by channelization activity
6 during the construction of the Duwamish Waterway, and is nearly
7 flat. Where present, the fill is underlain by alluvium that
8 consists of interbedded sands and silts to a depth of 60 to 80
9 feet. Depth to groundwater is variable within a range of several
10 feet (approximately 7 to 13 feet below ground surface) depending
11 on temporal and spatial considerations described above. Shallow
12 groundwater flow directions and flow rates are complicated by
13 anthropogenic modifications, seasonal variations in recharge, and
14 daily tidal influences. Flow direction varies from southwest to
15 northeast depending upon location and depth beneath the Facility.
16 Insufficient data exist to predict rates of flow that are
17 meaningful. The Facility is almost entirely covered by buildings
18 and concrete or asphalt pavement. It is in an industrial area at
19 the southern edge of Seattle, and is bounded on the west by the
20 Duwamish Waterway, on the north by Webster Street and property
21 owned by Crowley Marine Corporation, on the east by the AIRCO
22 Products plant and East Marginal Way, and on the south by the
23 Jorgenson Forge Corporation. The Facility layout is shown in
24 Figure 1 (Table 1 is a key to buildings and structures shown in
25 Figure 1). Eight general manufacturing processes are conducted
26 at the Facility in 12 buildings. Each of these processes use
27 chemical products that may contain hazardous constituents and may
28

BOEING PLANT 2 - ADMINISTRATIVE ORDER ON CONSENT - Page 10

1 become wastes. The eight processes are summarized below:

2
3 A. Machining of airplane parts is currently performed in
4 buildings 2-40, 2-41, and 2-44, and was previously performed
5 in building 2-10. Isolated, small machine shop areas are
6 located in some of the other buildings. Airplane parts have
7 been machined at the Facility since 1936. Various coolants,
8 such as Coolube 220, Trim sol, Dimcool Five Star 40, and
9 Blasocut 2000 have been used to cool operating machines.

10 B. Parts cleaning has been an ongoing operation at the
11 Facility since 1945. Currently, parts are cleaned in
12 buildings 2-31, 2-40, and 2-44. Previously, parts were
13 cleaned in buildings 2-10, 2-41 and 2-65. Parts are cleaned
14 in tanks using alkaline cleaners such as ammonium hydroxide,
15 sodium hydroxide, and potassium permanganate; products
16 containing sodium metasilicate, sodium phosphate, and
17 tribasic are also used for cleaning.

18 C. Chemical milling and clean etching to remove aluminum
19 from aircraft parts to make them lighter was performed at
20 the Facility from 1954 until 1992 in building 2-10. Clean
21 etching has been performed in building 2-31 since the late
22 1980s.

23 D. Airplane parts have been electroplated at the Facility
24 since 1941. In building 2-31, parts are electroplated to
25 apply coatings of zinc, copper, cadmium, aluminum, or
26 silver. Materials used in the plating baths include sodium
27 and potassium cyanide, cadmium oxide, caustic soda, sodium

1 and potassium carbonate, silver cyanide, silver metal,
2 sodium hydroxide, cadmium balls, nickel sulfate, cadmium
3 oxide, copper cyanide, zinc cyanide, and miscellaneous
4 products such as Duo Zinc 101, ROHC Super XL Brightener,
5 Rochelle Salts, En Strip, and Endox 214.

6 E. Chemical conversion coating processes were used at the
7 Facility from 1950 until June 1993 in buildings 2-10 and 2-
8 62 to provide a protective coating. Alodine chemical
9 conversion coating has been conducted in building 2-44 since
10 September 1993. During this process, parts are immersed in
11 tanks holding concentrated chromic acid and other acids such
12 as hydrofluoric acid, hydrochloric acid, sulfuric acid, and
13 nitric acid. The parts are rinsed with deionized water
14 after they are removed from the acid tanks.

15 F. Toolmaking has been performed since 1936 at the
16 Facility, and currently takes place in buildings 2-40, 2-49,
17 2-83, and 2-86. Various coolants and lubricating oils are
18 used to maintain the machines that make the tools.

19 G. Painting and paint stripping have been performed since
20 1956 at the Facility. Painting is currently done in
21 buildings 2-31, 2-62, and 2-108. Paint is sprayed in wet
22 booths and dry filter paint booths. Chemical paint
23 stripping was conducted in building 2-10 from about 1960 to
24 1992. Sandblasting was performed in building 2-62 from
25 about 1970 to June 1993.

26 H. Silver residue in photographic fixers was reclaimed at
27 the Facility in building 2-89 from 1982 until June 1993.

5.8. The 1990 annual dangerous waste report submitted to Ecology states that in 1990, 9890 tons of dangerous waste were generated and 81 tons of dangerous waste were stored at the Facility in containers and in aboveground and underground tanks. Hazardous waste and wastes containing hazardous constituents are generated at the various manufacturing process areas described in Paragraph 7. Table 2 summarizes past waste generation at the Facility. The Facility has also handled wastes and materials generated at other Boeing facilities. Hazardous wastes previously received at the reclamation yard included such substances as trichloroethylene and methyl ethyl ketone, which were shipped off-site for resale, disposal or reclamation.

5.9. A RCRA Facility Assessment ("RFA") was completed for the Facility on October 20, 1992. The RFA identified 86 Solid Waste Management Units ("SWMUs") where solid or hazardous waste has been managed at the Facility. EPA has concluded that further investigation is required to assess whether releases to soil or groundwater have occurred at the following SWMUs:

- 2-10.4 Zyglö penetrant spray booth
- 2-10.7 Paint strip tank line
- 2-10.8 Anodic and alodine tank lines
- 2-10.9 Aluminum chem mill area
- 2-15.13 Boiler valve pit
- 2-15.14 Bulk storage tank pit oil/water separator and oil holding tank
- 2-31.22 Brush plating area
- 2-31.23 Ammonium persulfate tank

- 1 • 2-31.24 Sodium hydroxide developer
- 2 • 2-31.25 Anodize aluminum room
- 3 • 2-31.26 Anodizing tank line
- 4 • 2-41.30 Manhole vault
- 5 • 2-41.31 Machine pits
- 6 • 2-41.33 Deactivated anodic tank line
- 7 • 2-41.34 Tunnel area
- 8 • 2-41.35 Quench tanks
- 9 • 2-41.36 Underflow flume
- 10 • 2-62.43 Tank line
- 11 • 2-63.47 Dilute chrome tank
- 12 • 2-64.48 Underground waste tank
- 13 • 2-64.49 Air compressor building sump and accumulation
- 14 area
- 15 • 2-65.50 Machine pit
- 16 • 2-70.55 East steam clean and underground bulk storage
- 17 tank
- 18 • 2-80.56 Sink sump
- 19 • 2-80.57 Generator sump
- 20 • 2-87.65 Machine pit
- 21 • 2-89.68 Reclamation yard
- 22 • 77 PCB retention tanks (vaults 9, 15 and 19)
- 23 • 78 Oil/water separators (Metro separator 2 and
- 24 oil separators 7, 8, 16, 19, 20, 21, and 22)
- 25 • 79 Cisterns and associated sumps

26 EPA has concluded that further investigation is required to
 27 assess whether releases to soil or groundwater have occurred at

1 the following locations, identified in the RFA as SWMU's, but
2 herein considered, pending further investigation, to be Areas of
3 Concern:

- 4 • 2-10.5 Paint booth area
- 5 • 2-31.21 TCE degreaser
- 6 • 2-41.29 TCE degreaser
- 7 • 2-41.32 Deactivated paint booths and sump
- 8 • 2-62.45 Paint booths and sump
- 9 • 2-66.52 Machine pit
- 10 • 2-66.53 TCE degreaser
- 11 • 2-80.58 Quench tanks and secondary containment
- 12 • 2-84.62 Machine pit
- 13 • 2-86.63 Wet paint booth
- 14 • 2-108.72 Wet paint booth
- 15 • 2-108.73 Paint booth sump
- 16 • 2-10.1A Hydraulic stamp machines and sumps
- 17 • 2-10.2A Decommissioned machine sumps
- 18 • 2-10.3A North TCE degreaser
- 19 • 2-10.4A South TCE degreaser
- 20 • 2-10.5A Polishing tank and existing paint booth
- 21 • 2-10.6A Quench tank

22 The following SWMUs were identified in the RFA as requiring
23 investigation, but are interim status units which are undergoing,
24 or have undergone, closure:

- 25 • 2-31.18 Area B acid waste hold tank
- 26 • 2-31.20 Deactivated cyanide hold area

27 The following SWMUs were identified in the addendum to the RFA as

1 not requiring further investigation, and are interim status units
2 which are undergoing, or have undergone, closure:

- 3 • 2-09.2 Chrome waste tanks
- 4 • 2-104.71 Central drummed waste storage area

5 The following SWMU is an interim status unit and was identified
6 in the RFA as requiring further investigation depending on the
7 results of the assessment that has been conducted in support of
8 closure plan preparation:

- 9 • 2-91.70 Deactivated waste oil and coolant hold area

10 Thirty-three additional SWMUs, for which no further action is
11 required, were also identified in the RFA.

12 5.10. Respondent has previously undertaken various
13 investigation activities at the Facility. The following
14 subsurface investigation reports were prepared by the Respondent
15 and submitted to the EPA:

16 A. Soil and Groundwater Data Summary, Boeing Plant 2
17 Southeast Project, Boeing Plant 2 Facility, Tukwila,
18 Washington, Volumes I and II, dated May 12, 1992, by Landau
19 Associates, Inc. (L. M. Babich to S. E. Burges, October 22,
20 1992)

21 B. Initial Evaluation, Boeing Plant 2, Buildings 2-10 and
22 2-15, Seattle, Washington, dated May, 1992, by Roy F.
23 Weston, Inc. (L. M. Babich to S. E. Burges, October 22,
24 1992)

25 C. Soil and Groundwater Investigation, Plant 2 Southwest,
26 King County Washington, dated May 10, 1991, by Landau
27 Associates, Inc. (L.M. Babich to S.E. Burges, October 22,

1992)

D. Soil and Groundwater Investigation, Boeing Plant 2 Southeast Project, Boeing Plant 2 Facility, Tukwila, Washington, dated December 21, 1992, by Landau Associates, Inc. (L. M. Babich to S. E. Burges, December 21, 1992)

E. Phase II Subsurface Environmental Assessment, Boeing-North Duwamish Campus, Buildings 2-10, 2-15, Seattle, Washington, dated December, 1992, by Roy F. Weston, Inc. (L. M. Babich to S. E. Burges, December 21, 1992)

F. Data Summary Report, Soil and Groundwater Site Characterization, Southwest Portion of Boeing Plant 2, Tukwila, Washington, dated January 27, 1992, by Geo Engineers, Inc. (L. M. Babich to S. E. Burges, January 23, 1993)

G. Soil and Groundwater Data Summary, Building 2-91, Boeing Plant II Facility, Tukwila, Washington, dated March 18, 1993, by Landau Associates, Inc. (L. M. Babich to S. E. Burges, April 30, 1993)

5.11. The reports listed in 5.10 summarize the results of chemical analyses of soil and groundwater which indicate that various releases of hazardous constituents have occurred at or from the Facility, leading to soil and groundwater contamination at several locations. These data are summarized briefly below:

A. Groundwater and soil contamination in the vicinity of the North TCE degreaser (SWMU 2-10.3A) are documented in a Phase II Subsurface Environmental Assessment report by Roy F. Weston, Inc., dated December 1992 ("Weston, 1992").

1 Volatile organic compounds and metals in excess of Proposed
2 RCRA Subpart S Action Levels were observed in groundwater
3 from wells MW-210A, MW-212A, MW-217A, MW-218A, and MW-218B.
4 Maximum concentrations (in ug/l) reported were as follows:
5 Trichloroethene (TCE), 380,000; vinyl chloride, 810; cis-
6 1,2-dichloroethene (cis-DCE), 53,000; methylene chloride,
7 50; 1,1-dichloroethene, 26; arsenic, 53; beryllium, 4;
8 cadmium, 10; lead, 84; vanadium, 618. Although TCE and its
9 degradation products were detected in 9 of 10 soil borings
10 in the vicinity of the North degreaser, only vinyl chloride
11 was present at concentrations in excess of Proposed RCRA
12 Subpart S Action Levels (in borings D-43, MW-212A, and MW-
13 218A; the maximum concentration was 1500 ug/kg).

14 B. Groundwater contamination in the vicinity of the South
15 TCE degreaser ("SWMU 2-10.4A") is also documented in Weston,
16 1992. Volatile organic compounds in excess of Proposed RCRA
17 Subpart S Action Levels were observed in groundwater from
18 wells MW-209A, MW-213A, and MW-214A. Maximum concentrations
19 (in ug/l) reported were as follows: TCE, 9,300; vinyl
20 chloride, 10; cis-DCE, 1,100; methylene chloride, 6.8.

21 C. Groundwater contamination in the vicinity of the Vehicle
22 Refueling Station is also documented in Weston, 1992.

23 Benzene concentrations in excess of Proposed RCRA Subpart S
24 Action Levels were observed in groundwater from wells MW-
25 207A and MW-223A. Maximum concentrations (in ug/l) reported
26 also included beryllium, 3 and vanadium, 308.

27 D. Groundwater and soil contamination in the vicinity of

1 and downgradient from the cisterns (SWMU 79) is documented
2 in a Soil and Groundwater Investigation Boeing Plant 2
3 Southeast Project report by Landau Associates, Inc. dated
4 December 21, 1992 (Landau, 1992). Organic compounds and
5 metals in excess of Proposed RCRA Subpart S Action Levels
6 were observed in groundwater from wells MW-101a, MW-102a,
7 MW-104a, MW-105a, MW-106a, MW-106b, MW-107a, MW-109a, MW-
8 110a, and MW-110b. Maximum concentrations (in ug/l)
9 reported were as follows: vinyl chloride, 170; cis-DCE, 370;
10 1,2-dichloroethane, 9.1; TCE, 1200; 1,1,2-trichloroethane,
11 8.5; tetrachloroethene, 36; PCBs, 1.9; chromium, 627. In
12 addition, arsenic concentrations in all wells were above the
13 proposed RCRA action level, but near observed regional
14 background concentrations. Soils from MW-102c and MW-109c
15 exceeded action levels for PCBs and cadmium, with respective
16 maxima of 0.174 and 65 mg/kg.

17 E. Groundwater and soil contamination in the vicinity of
18 and downgradient from the southwest corner of Building 2-66
19 is documented in a Soil and Groundwater Site
20 Characterization Southwest Portion of Boeing Plant 2 report
21 by GeoEngineers, Inc. dated January 27, 1993 (GeoEngineers,
22 1993). Organic compounds and metals in excess of Proposed
23 RCRA Subpart S Action Levels were observed in groundwater
24 from wells MW-1, MW-2A, MW-2B, MW-3, MW-4, MW-5A, MW-5C, MW-
25 6, MW-7, MW-8A, MW-8B, MW-9B, MW-10, MW-11, MW-12, MW-13,
26 MW-14, MW-15, MW-16, MW-17, MW-21, MW-21A to C, MW-25, and
27 MW-26. Maximum concentrations (in ug/l) reported were as

1 follows: vinyl chloride, 6500; 1,1-Dichloroethene, 270; 1,1-
2 Dichloroethane, 78; trans-DCE, 300; cis-DCE, 28000; 1,2-
3 dichloroethane, 23; TCE, 300000; 1,1,2-trichloroethane, 50;
4 benzene, 31; tetrachloroethene, 22; toluene, 7600;
5 ethylbenzene, 990; PCBs, 2.3; cadmium, 37; selenium, 60; and
6 thallium, 60.

7 F. Respondent has begun to undertake interim measures to
8 address various releases to soil and groundwater at the
9 Facility. On April 21, 1993, The Boeing Company submitted
10 to EPA a technical memorandum titled "Technology Screening
11 and Selection Evaluation For RCRA Interim Actions at the
12 Boeing Commercial Airplane Group, Plant 2, Seattle/Tukwila,
13 Washington" dated April, 1993, by Roy F. Weston, Inc. The
14 technical memorandum provided an evaluation of technologies
15 for stabilizing groundwater contamination at three locations
16 within the Plant 2 Facility pending implementation of
17 permanent corrective measures. As a result of the
18 evaluation, sheet piling was the recommended interim
19 measure. Correspondence dated May 11, 1993 from EPA (Region
20 10) project coordinator Sylvia E. Burges to Boeing
21 Environmental Affairs Manager L. Michael Babich III,
22 provided concurrence, in principle, on the proposed interim
23 measures with the understanding that some questions
24 regarding objectives and effectiveness of the sheet piling
25 are to be resolved during the design phase.

26 5.12. The hazardous waste or hazardous constituents
27 identified in paragraph 5.11 above, may pose a threat to human

1 health or the environment. The following chemicals are known or
2 probable human carcinogens: vinyl chloride, benzene, TCE,
3 methylene chloride, 1,2-dichloroethane, tetrachloroethene, PCBs,
4 arsenic, beryllium, cadmium, chromium (VI) and lead. Aquatic
5 life may be harmed by exposure to the following chemicals, which
6 were present in groundwater at the Facility: TCE, DCE, benzene,
7 toluene, ethylbenzene, PCBs, arsenic, beryllium, cadmium, lead,
8 selenium, thallium, and chromium (if the metal is in the VI
9 valence state).

10 5.13. The Facility is approximately 2.5 miles upstream from
11 the mouth of the Duwamish Waterway. The Duwamish River begins at
12 the confluence of the Black River and Green River and changes its
13 name to the Duwamish Waterway at the Oxbow Turning Basin. Twelve
14 miles downstream, the Duwamish Waterway enters Elliott Bay at the
15 northern end of Harbor Island. The Duwamish Waterway generally
16 exhibits a saltwater wedge stratification, which is characterized
17 by two-layer flow. Saltwater intrusion has been observed as far
18 as mile 10 during extreme high tides and low river flow. Soils
19 at the plant site are covered with concrete, asphalt, and
20 buildings, and Facility access is controlled, preventing entrance
21 by the public. The area contains numerous other industrial
22 facilities, including the Jorgensen Forge Corporation plant to
23 the south, Crowley Marine to the north, and the AIRCO Products
24 plant and King County International Airport to the east.

25 5.14. Current information is inconclusive as to whether
26 hazardous constituents have migrated from the Facility with the
27 shallow groundwater that discharges to the Duwamish Waterway that
28

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1 borders much of the Facility (Weston, 1992; Landau, 1992;
2 GeoEngineers, 1993). Average linear velocity of groundwater flow
3 toward the waterway has been estimated as 13.3 m/yr in the
4 shallow aquifer in the southwest portion of the site
5 (GeoEngineers, 1993). Potential receptors of such releases
6 include the aquatic flora and fauna of the Waterway and consumers
7 of potentially contaminated game species taken from the Waterway.
8 The general population is not a likely receptor because
9 groundwater near the plant area is not used for drinking water or
10 other domestic purposes.

11 12 VI. CONCLUSIONS OF LAW AND DETERMINATIONS

13 6.1. Respondent is a "person" within the meaning of Section
14 1004(15) of RCRA, 42 U.S.C. § 6903(15).

15 6.2. Respondent is the owner or operator of a facility, as
16 "facility" is defined in 40 C.F.R. § 260.10, that has interim
17 status pursuant to Section 3005(e) of RCRA, 42 U.S.C. § 6925(e).

18 6.3. Certain waste and constituents thereof found at the
19 Facility are hazardous waste and/or hazardous constituents as
20 defined and set forth in Section 1004(5) of RCRA, 42 U.S.C.
21 § 6903(5), and Section 3001 of RCRA, 42 U.S.C. § 6921,
22 respectively, and 40 C.F.R. Part 261.

23 6.4. There has been a release of hazardous waste into the
24 environment from the Facility, as "release" is defined in Section
25 101 (22) of CERCLA, 42 U.S.C. § 9601(22). Hazardous wastes
26 and/or constituents released from the Facility may have migrated
27 on- and off-site in both vertical and horizontal directions. It
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1 is necessary to determine the three-dimensional concentrations of
2 these wastes and/or constituents at and beyond the Facility, and
3 to assess whether such concentrations present unacceptable risks
4 to human health or the environment.

5 6.5. Pursuant to the Findings of Fact in Section V of this
6 Order, EPA has determined that:

7 The horizontal and vertical extent of contaminant migration
8 at and from the Facility has not been, and cannot be, adequately
9 determined from data available to EPA. The findings of the Work
10 to be performed pursuant to this Order should provide an improved
11 understanding of the extent of contamination and migration of
12 hazardous waste and hazardous constituents at and from the
13 Facility.

14 6.6. The actions required by this Order are necessary to
15 protect human health and the environment.

16 17 VII. PROJECT COORDINATOR

18 7.1. Within fifteen (15) days after issuance of this Order,
19 Respondent shall designate a Project Coordinator and shall notify
20 EPA in writing of the Project Coordinator it has selected. EPA's
21 Project Coordinator shall be Sylvia Burges, RCRA Compliance
22 Section, Region 10 EPA, 1200 Sixth Avenue, HW-104, Seattle,
23 Washington 98101, unless Respondent is otherwise notified in
24 writing by EPA. Each Project Coordinator shall be responsible
25 for overseeing the implementation of this Order and for
26 designating a person to act in his/her absence. The EPA Project
27 Coordinator will be EPA's designated representative for the

1 Facility. All communications between Respondent and EPA shall be
2 directed to and from the Project Coordinators.

3 7.2. Respondent may change its Project Coordinator upon five
4 (5) days written notice to EPA.

5 7.3. The absence of the EPA Project Coordinator from the
6 Facility shall not be cause for the stoppage of any Work.

7
8 VIII. WORK TO BE PERFORMED

9 8.1. All Work shall be performed in accordance with this
10 Order, RCRA and all regulations promulgated thereunder, and
11 consistent with applicable EPA guidance documents. Within forty-
12 five (45) days after issuance of this Order, Respondent will
13 submit a Health & Safety Plan ("HS Plan"). The HS Plan will
14 conform to all applicable federal and state requirements. All
15 work performed pursuant to this Order will follow the guidelines
16 and requirements of the HS plan.

17
18 A. RELEASE ASSESSMENT ("RA") AND INTERIM MEASURES ("IM")

19 8.2. Within sixty (60) days after the issuance of this
20 Order, Respondent shall submit a Release Assessment to EPA that
21 shall include the following elements:

- 22 • A Current Conditions Summary which characterizes, based
23 on available data, the current conditions at the
24 Facility, including information on geology and
25 geohydrology at the Facility, nature and extent of
26 contamination, releases or threats of releases that may
27 endanger human health and/or the environment, and a

1 description and assessment of any interim measures that
2 have already been taken.

- 3 • Evaluation of available data and assessment of the need
4 for interim measures consistent with paragraph 8.4
5 below.

6 8.3. EPA will review Respondent's RA and other information
7 available to EPA, and select, if any, appropriate interim
8 measures for implementation by Respondent, as set forth in this
9 section. If deemed appropriate by EPA, such selection may be
10 deferred until additional data is collected.

11 8.4. Respondent shall continue to evaluate available data to
12 assess the opportunities for appropriate interim measures while
13 implementing this Order. Respondent shall document such
14 evaluation in the periodic report. Interim measures are to be
15 used to achieve the goal of stabilization or containment to
16 control or abate immediate threats to human health and/or the
17 environment, and to prevent or minimize the spread of
18 contaminants while long-term corrective measures are being
19 evaluated. Interim measures, when implemented, will mitigate the
20 release or threat of release of hazardous waste or hazardous
21 constituents, or mitigate the impact on receptors affected by
22 such releases.

23 8.5. Within thirty (30) days after a determination by EPA
24 that interim measures are required (or such longer period as may
25 be specified by EPA, given the complexity and scope of the tasks
26 to be performed), Respondent shall submit a workplan to EPA for
27 the implementation of interim measures ["IM Workplan"]. The IM

1 Workplan is subject to approval by EPA and shall provide for the
2 performance of interim measures necessary to achieve
3 stabilization at the Facility. The IM Workplan shall include the
4 following sections:

- 5 • Interim Measures Objectives
- 6 • Design Plans and Specifications
- 7 • Operation and Maintenance
- 8 • Project Schedule
- 9 • Interim Measure Construction Quality Assurance
- 10 • Reporting Requirements.

11 8.6. In the event Respondent identifies an immediate threat
12 to human health or the environment, Respondent shall notify the
13 EPA Project Coordinator, orally within forty-eight (48) hours
14 after discovery and notify EPA in writing within five (5) days
15 after discovery, summarizing the immediacy and magnitude of the
16 threat. Within fifteen (15) days (or such longer period as may
17 be specified by EPA, given the complexity and scope of the tasks
18 to be performed) after notifying EPA, Respondent shall submit to
19 EPA for approval a description of measures to be taken and a
20 schedule for conducting the work (including preparation and
21 submittal of any Workplans). If EPA determines that immediate
22 action is required, EPA may authorize Respondent to act prior to
23 EPA receipt of Respondent's description of proposed measures.

24 8.7. If EPA identifies an immediate threat to human health
25 and/or the environment, EPA will notify Respondent in writing.
26 Within fifteen (15) days (or such longer period as may be
27 specified by EPA, given the complexity and scope of the tasks to

1 be performed) after receiving EPA's written notification,
2 Respondent shall submit to EPA for approval a description of
3 measures to be taken and a schedule for conducting the work
4 (including preparation and submittal of any Workplans). If EPA
5 determines that immediate action is required, EPA may authorize
6 Respondent to act prior to EPA receipt of Respondent's
7 description of proposed measures.

8 8.8. If at any time during the pendency of this Order, EPA
9 and/or Respondent identified new or additional interim measures
10 that would further the achievement of stabilization and that
11 would mitigate a threat to human health or the environment, then
12 such party may propose to the other that such measures be taken.
13 Any such proposal shall be subject to the provisions for
14 Additional Work in Section X.

15
16 B. RCRA FACILITY INVESTIGATION ("RFI")

17 8.9. Respondent shall perform and complete an RFI at and for
18 the Facility. Within ninety (90) days after submittal of the RA,
19 Respondent shall submit a draft workplan to EPA for completing a
20 RCRA Facility Investigation ("RFI Workplan"). The RFI Workplan
21 shall be developed in accordance with RCRA, and all applicable
22 regulations promulgated thereunder. The RFI Workplan shall be
23 consistent with Volume I, Section 2 of EPA 530/SW-89-031, "RCRA
24 Facility Investigation Guidance," (May 1989) and other applicable
25 EPA guidance.

26 8.10. The RFI Workplan shall document the procedures and
27 schedules Respondent shall follow to conduct investigations which

1 will generate information and data adequate to:

2 A. Characterize the hydrogeologic regime underlying the
3 Facility;

4 B. Gather data needed to make decisions on stabilization
5 during the early phase of the RFI;

6 C. Evaluate the possibility of releases of hazardous
7 constituents at the SWMU's and Areas of Concern at the
8 Facility. When appropriate, evaluation of the possibility
9 of releases at the SWMUs and/or Areas of Concern can be
10 performed in a phased manner. In the first phase of the
11 investigation at a given SWMU or Area of Concern, an
12 engineering or other nonintrusive evaluation may be
13 performed as a precursor to subsurface soil and groundwater
14 investigation. Results of such evaluation will be used to
15 determine whether a second phase of investigation is
16 warranted. A phased approach may also be used at the five
17 TSD units to be investigated, in order to coordinate with
18 TSD closure activities, as described in Section VIII.E.

19 D. Identify and characterize ground water contamination,
20 including dissolved plumes and the presence of light or
21 dense non-aqueous phase liquids;

22 E. Characterize the concentrations, rates and directions of
23 movement, chemical nature and extent of contamination which
24 originated at or from the Facility, and which is present in
25 any environmental medium off-site or on-site;

26 F. Identify potential human and ecological receptors to
27 hazardous constituents at or from the Facility;

1 G. Propose media cleanup levels and points of compliance
2 for all hazardous constituents detected at levels of
3 concern, as determined by the Health and Environmental
4 Evaluation; and

5 H. Support the development and analysis of corrective
6 measure alternatives.

7 8.11. The RFI Workplan must include sections covering the
8 following:

- 9 • Project Management
- 10 • Investigations to be Conducted and Rationale
- 11 • Quality Assurance
- 12 • Data Management
- 13 • Health and Environmental Evaluation
- 14 • Schedules, including submittal of Phase I and II RFI
15 Reports, and a comprehensive RFI Report.

16 8.12. The RFI Workplan shall describe the available data to
17 be used, additional data to be collected, and methodology to be
18 used to assess the potential risk to human health and to evaluate
19 potential environmental impacts. This analysis will be consistent
20 with EPA guidance "Guidelines for Developing Risk-Based Cleanup
21 Levels at RCRA Sites in Region 10: ("RCRA Cleanup Guidance") and
22 "RCRA Facility Investigation (RFI) Guidance, Interim Final
23 (Volume I), OSWER Directive 9502.00-60."

24 A. The first step in the analysis will be identification
25 of constituents of concern and exposure pathways in each
26 environmental medium. Concentrations of these constituents
27 will then be compared to human health-based criteria using

1 promulgated criteria or standards. If appropriate
2 promulgated criteria exist for a particular constituent and
3 exposure pathway, then these criteria (including criteria
4 promulgated under the Washington Model Toxics Control Act,
5 RCW Chapter 70.105D) may be proposed as cleanup levels. If
6 no promulgated criteria exist for a specific contaminant or
7 exposure pathway, then human health based criteria will be
8 derived from risk-based concentrations developed using EPA-
9 approved exposure assumptions and EPA Integrated Risk
10 Information System data, consistent with the methodology in
11 the RCRA Cleanup Guidance.

12 B. Cleanup levels identified will be adjusted as
13 appropriate for multiple constituents and/or multiple
14 exposure pathways. Concentrations of constituents of concern
15 will also be compared to relevant ecologically-based
16 criteria and standards. Additional qualitative evaluation of
17 potential ecological impacts will be presented, consistent
18 with the RCRA Cleanup Guidance, if such criteria are not
19 available for constituents of concern in affected
20 environmental media.

21 C. Based upon this analysis, Respondent's draft RFI report
22 shall contain proposed media cleanup levels and points of
23 compliance. Respondent's Submittal must include a
24 description of methods used to assess risk to human health
25 and the environment for the purpose of developing proposed
26 media cleanup levels, and a justification for the non-
27 inclusion of any hazardous constituent detected in any

1 environmental medium. As appropriate to support required CMS
2 activities, EPA will select target media cleanup levels and
3 points of compliance in conjunction with approval of the
4 final RFI Report.

5 8.13. EPA anticipates that multiple phases of the RFI may
6 be required to completely address potential releases of hazardous
7 constituents at or from the Facility. All phases of the RFI
8 shall be completed prior to submittal of the draft comprehensive
9 RFI Report, which may be a modification of previously submitted
10 reports, for EPA approval.
11

12 C. CORRECTIVE MEASURE STUDY ("CMS")

13 8.14. Respondent shall perform a CMS at and for the
14 Facility. Respondent shall submit a draft CMS Workplan to EPA
15 within sixty (60) days after the submittal of the draft
16 comprehensive RFI Report. The CMS Workplan shall be developed
17 in a manner consistent with the CMS Scope of Work contained in
18 Attachment A to this Order, and with applicable EPA guidance
19 documents.

20 8.15. The CMS Workplan shall detail the methodology for
21 developing and evaluating the potential corrective action
22 alternatives to remediate contamination exceeding EPA-selected
23 target cleanup levels for hazardous constituents released at or
24 from the Facility.

25 8.16. Potential Corrective Measures that involve treatment
26 shall require treatability studies unless Respondent can
27 demonstrate to EPA satisfaction that they are not needed. If

1 treatability studies are needed, Respondent shall include in the
2 CMS Workplan a description of the type (e.g., bench versus pilot)
3 and design of the study or studies.

4 8.17. In accordance with the schedule set forth in the
5 approved CMS Workplan, Respondent shall submit a draft CMS Report
6 to EPA containing the information delineated in Attachment A to
7 this Order. Respondent may include a justified recommendation
8 for remedy selection. The CMS Report may delineate any areas for
9 which Respondent requests designation as a Corrective Action
10 Management Unit (CAMU).

11 8.18. EPA will select proposed corrective action for the
12 Facility in a Statement of Basis ("SB"), which will include a
13 description of all proposed corrective measures, the bases
14 therefor, media cleanup levels and points of compliance for
15 hazardous constituents of concern.

16 8.19. EPA will receive public comment on the RFI and CMS
17 Reports, the SB and the administrative record for a period of at
18 least thirty (30) days. A public hearing may be held at EPA
19 discretion.

20 8.20. Following public comment, EPA may finalize the
21 selection of the corrective action to be performed, or may
22 require Respondent to revise the CMS Report, and/or perform
23 additional Work.

24 8.21. EPA will publish a Final Decision and Response to
25 Comments, which will address public comments and explain the
26 bases and rationale for EPA's decisions.

1 D. CORRECTIVE MEASURES IMPLEMENTATION ("CMI")

2 8.22. Within forty-five (45) days after Respondent's receipt
3 of EPA's Final Decision and Response to Comments, Respondent
4 shall submit a draft CMI Workplan to EPA, consistent with the
5 applicable portions of the CMI Scope of Work (Attachment B).

6 8.23. The CMI Workplan shall be designed to provide for the
7 design, construction, operation, maintenance, and monitoring of
8 all corrective measures at the Facility.

9 8.24. Within thirty (30) days after Respondent receives
10 written approval from EPA of the CMI Workplan, Respondent shall
11 commence Work in accordance with the schedule therein. The CMI
12 Workplan schedule may provide for commencement of any Work at TSD
13 units to coincide with Ecology approval of closure plans for
14 those units.

15 8.25. Notwithstanding any other provision in this Consent
16 Order, the parties agree that if conditions contained in
17 Paragraph 8.26 below are met and Respondent does not want to
18 implement the final corrective measure selected by EPA under
19 consent, Respondent may withdraw its consent to implement said
20 corrective measure. To be effective, such withdrawal of consent
21 must be in writing, signed by the company signatory to this
22 Consent Order, and received by the EPA Hazardous Waste Division
23 Director no later than fifteen (15) days from receipt of the
24 final dispute resolution decision by EPA.

25 8.26. Respondent's right to withdraw its consent is limited
26 to implementation of the corrective measure selected by EPA only,
27 and such right to withdraw shall not accrue until: (1) EPA has
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1 selected a final corrective measure as provided in this Consent
2 Order; (2) and EPA issues a final decision under the dispute
3 resolution procedures contained in Section XVII hereto. Nothing
4 in this Section shall affect or diminish Respondent's consent to
5 any other provision in this Order, including its obligations
6 hereunder to conduct Interim Measures, an RFI, a CMS, additional
7 work as provided in Section X, or issuance of stipulated
8 penalties, nor Respondent's waiver of a public hearing under
9 Section 3008(b), 42 U.S.C. §6928(b) and 40 CFR Parts 22 and 24 as
10 to the issuance/entry and validity of the Order as provided in
11 Section IV, Paragraph 5 of this Consent Order.

12 8.27. If Respondent exercises its right to withdraw its
13 consent to implement the corrective measures as provided in this
14 Section, EPA retains all authorities it has under RCRA and CERCLA
15 to enforce implementation of the corrective measure or conduct
16 response actions related to the Facility.

17 18 E. COORDINATION WITH TSD CLOSURES

19 8.28. Performance of certain Work under this Order will
20 require an interface between corrective action, for which EPA has
21 authority, and RCRA hazardous waste storage unit TSD closures,
22 for which EPA has delegated authority to Ecology. Six of the
23 SWMUs identified in the RFA report were operated as RCRA
24 regulated TSD units. These units were identified as Areas 1
25 through 6 in the Part B permit application. The SWMUs are listed
26 below:

1 SWMU # 2-01.1 2-01 Landing Gear Cleaning Sump (Area 5)
2 SWMU # 2-09.2 Chrome Waste Tanks (Area 4)
3 SWMU # 2-31.18 Area B Acid Waste Hold Tank (Area 3)
4 SWMU # 2-31.20 Deactivated Cyanide Hold Area (Area 6)
5 SWMU # 2-91.70 Deactivated Waste Oil and Coolant Hold
6 Area (Area 2)
7 SWMU # 2-104.71 Central Drummed Waste Staging Area
8 (Area 1)

9 Closure of the 2-01 Building landing gear cleaning sump has been
10 completed and the closure was approved by Ecology on July 21,
11 1992 (J. Sellick to J. Johnstone). Partial closure of the 2-09
12 Building chrome waste tanks and the Building 2-31 cyanide hold
13 area was completed and closure certification reports were
14 submitted to Ecology on June 7, 1993 (L. Babich to B. Maeng).
15 Closure plans for the aboveground portion of the Building 2-31
16 area B acid waste hold tank, the Building 2-91 deactivated waste
17 oil and coolant hold area, and the Building 2-104 central drummed
18 waste staging area were submitted to Ecology on June 7, 1993 (L.
19 Babich to B. Maeng).

20 EPA and Respondent contemplate that, where necessary, and upon
21 approval by Ecology, Respondent will perform further
22 investigation at TSD units (other than the 2-01 unit, for which
23 final closure is approved) within the framework of the RFI/CMS
24 portions of the corrective action process. Based on the results
25 of the RFI/CMS work at these units, the Respondent will develop
26 final closure performance standards, prepare closure plans for
27 the subsurface decontamination and submit the plans to Ecology

1 for approval. Upon approval of the plans, Respondent may
2 implement closure in conjunction with the CMI Work required
3 pursuant to this Order.

4
5 IX. COMMUNITY RELATIONS

6 9.1. Community relations regarding implementation of this
7 Order are the primary responsibility of EPA. Respondent shall
8 cooperate and provide assistance to EPA upon request for its
9 community relations activities.

10
11 X. AGENCY APPROVALS/SUBMITTALS/PROPOSED
12 CONTRACTOR/ADDITIONAL WORK

13
14 EPA APPROVALS

15
16 10.1. Respondent shall submit initial draft Submittals
17 pursuant to the schedules required by this Consent Order or as
18 otherwise approved hereunder. With the exception of periodic
19 progress reports, health and safety plans and quality assurance
20 project plans, EPA will review all Submittals required by this
21 Order, and will provide written approval, or disapproval with
22 comments and/or modifications to be made by Respondent. EPA may
23 also modify any revised Submittal and approve it as modified. A
24 Submittal shall become final when it is approved by EPA in
25 writing.

26 10.2. Following approval of any Submittal, Respondent shall
27 commence all Work required thereby within fifteen (15) days after
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1 receipt of EPA approval, unless a longer time is specified by
2 EPA. All Work must be performed in accordance with the
3 standards, specifications and schedules in the approved
4 Submittal, and any applicable, previously approved Submittals.

5 10.3. When EPA provides comments or proposed modifications
6 to Respondent on any Submittal, and if Respondent agrees with
7 EPA's comments and/or proposed modifications, Respondent shall
8 submit a revised Submittal incorporating all of EPA's comments
9 and/or proposed modifications within thirty (30) days of
10 Respondent's receipt of EPA's comments and/or proposed
11 modifications, unless a longer time is specified by EPA. If,
12 following submission of an initial draft Submittal, Respondent
13 disagrees or has questions concerning EPA's comments and/or
14 required modifications, Respondent must, within ten (10) days
15 after receipt of EPA's comments or required modifications,
16 request a meeting or telephone conference in writing to resolve
17 the matter. Such written request will establish a thirty (30)
18 day informal resolution period, and shall include a statement of
19 the issues Respondent wishes to address. The thirty (30) day
20 informal resolution period shall extend the due date for
21 resubmittal as provided in Paragraph 10.4. This informal
22 resolution period applies only to initial draft Submittals,
23 unless EPA agrees to such a period for a resubmittal. Respondent
24 may request an extension to the thirty (30) day informal
25 resolution period which may be granted at EPA's discretion.

26 10.4. If agreement is reached within the informal resolution
27 period, Respondent shall incorporate into a revised Submittal the
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1 agreed-upon comments and/or modifications within thirty (30) days
2 after reaching agreement, unless a longer time is specified by
3 EPA. If agreement is not reached within the informal resolution
4 period, EPA shall send a written letter of disapproval to
5 Respondent. Within twenty (20) days of receipt of the written
6 disapproval letter, Respondent shall submit a revised, final
7 draft Submittal which incorporates all EPA comments or required
8 modifications, unless it invokes the dispute resolution
9 procedures in Section XVII of this Order for all comments or
10 required modifications Respondent is unwilling to make.

11 10.5. Verbal approval, advice, suggestions, or comments by
12 EPA personnel or representatives does not constitute an approval
13 or requirement under any circumstances except as provided in
14 Section XII regarding EPA approval of emergency field activities.

16 SUBMITTALS

17 10.6. Beginning with the first full month following the
18 issuance of this Order, and throughout the period that this Order
19 is effective, Respondent shall submit narrative progress reports
20 to EPA documenting activities conducted, pertinent information
21 obtained, significant problems encountered, and activities
22 planned for the following reporting period. Such reports shall
23 be submitted by the fifteenth (15th) day of each month, or as
24 otherwise specified by EPA.

25 10.7. EPA may, in its discretion, extend due dates for
26 Submittals. All extensions must be in writing.

27 10.8. Four (4) copies of all Submittals shall be hand
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1 delivered or sent by express mail to the EPA Project Coordinator
2 or to other addressees she/he designates. One copy shall also be
3 submitted concurrently by regular mail to: Boeing Plant 2
4 Coordinator, Washington Department of Ecology, 3190 160th Avenue
5 S.E., Bellevue, Washington 98008-5452. All submittals shall be
6 printed on recycled paper to the extent practicable. For
7 purposes of determining compliance with applicable schedules,
8 Respondent's Submittals shall be deemed to be submitted on the
9 date deposited for delivery by one of the methods specified in
10 this paragraph.

11 12 PROPOSED CONTRACTOR/CONSULTANT

13 10.9. All Work shall be performed under the direction and
14 technical oversight of a hydrologist, geologist, environmental
15 scientist or professional engineer with expertise in hazardous
16 waste cleanup. Respondent's contractors and consultants shall
17 have the technical expertise sufficient to adequately perform all
18 aspects of the Work they perform. Within fourteen (14) days
19 after issuance of this Order, or within fourteen (14) days after
20 hiring, whichever is later, Respondent shall notify EPA in
21 writing of the name of the firm engaged for technical oversight
22 and of any contractors or consultants, and their subcontractors,
23 which Respondent intends to use in performing Work.

24 25 ADDITIONAL WORK

26 10.10. EPA may determine or Respondent may propose that
27 additional Work is or may be necessary to implement this Order.

1 EPA will specify in writing the basis for its determination that
2 the additional Work is necessary. Within fifteen (15) days after
3 the receipt of such determination, Respondent shall notify EPA of
4 its willingness to perform the additional Work or may request a
5 meeting with EPA to discuss the proposed additional Work. If,
6 after such meeting, Respondent disagrees with EPA's request for
7 additional Work, Respondent may invoke dispute resolution
8 procedures set forth in Section XVII, below. If dispute
9 resolution is not invoked on EPA's written request for additional
10 Work, within thirty days of receipt of EPA's notice, unless a
11 longer period is specified by EPA based on the complexity and
12 scope of the Work to be performed, Respondent shall submit a
13 Workplan for EPA review incorporating the additional Work. EPA's
14 review and approval of such Workplan shall be subject to the
15 procedures set forth in Section X. Upon written approval of the
16 Workplan, Respondent shall implement the Workplan in accordance
17 with the schedule contained therein. All additional Work
18 performed by Respondent under this paragraph shall be performed
19 in a manner consistent with this Order.

20 21 XI. QUALITY ASSURANCE

22 11.1. All sample collection and analysis activities pursuant
23 to this Order, shall be pursuant to EPA-approved quality
24 assurance, quality control, and chain-of-custody procedures as
25 specified in Attachment C.

26 11.2. In addition, Respondent shall:

27 A. Develop and submit a Quality Assurance Project Plan

1 ("QAPP") to EPA consistent with Attachment C.

2 B. Submit data packages to EPA as specified in approved
3 Workplans. Data packages shall be prepared in a manner
4 consistent with the documentation and information guidelines
5 delineated in Attachments C and D to this Order.

6 C. Submit to EPA data summaries and data validation
7 reports, where applicable, per the schedule in approved
8 Workplans.

9 11.3. All data submitted to EPA must be of known and
10 documented quality. Respondent shall ensure and monitor the
11 quality of data obtained by any laboratory which Respondent
12 utilizes for analyses of samples. EPA may reject any data not
13 generated in accordance with the requirements specified in the
14 QAPP or in approved Workplans.

15
16 XII. SAMPLING AND DATA/DOCUMENT AVAILABILITY

17 12.1. Respondent shall submit the results to EPA of all
18 sampling and/or tests or other data generated and/or prepared by
19 Respondent pursuant to this Order. If submission schedules in
20 EPA-approved Workplans differ from those in any section of or
21 attachment to this Order, the approved Workplan schedule will be
22 followed.

23 12.2. Respondent shall notify EPA in writing at least seven
24 (7) days before engaging in any field activities, such as well
25 drilling, installation of equipment, or sampling. If Respondent
26 believes it must commence emergency field activities without
27 delay, Respondent may seek emergency telephone authorization from
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1 the EPA Project Coordinator or, if the EPA Project Coordinator is
2 unavailable, his/her supervisors, to commence such activities
3 immediately. Any such emergency approval must be
4 contemporaneously documented in a writing forwarded by overnight
5 mail to EPA. EPA or its authorized representatives may take
6 split or duplicate samples of all samples collected by Respondent
7 pursuant to this Order. Similarly, at the request of Respondent,
8 EPA shall allow Respondent or its authorized representative(s) to
9 take split or duplicate samples of all samples collected by EPA
10 at the Facility.

11 12.3. Respondent may assert a business confidentiality claim
12 covering all or part of any information submitted to EPA pursuant
13 to this Order. Any assertion of confidentiality must be
14 accompanied by information that satisfies 40 C.F.R. § 2.204(e)(4)
15 or such claim shall be deemed waived. Information determined by
16 EPA to be confidential shall be disclosed only to the extent
17 permitted by 40 C.F.R. Part 2. If no such confidentiality claim
18 accompanies the information when it is submitted to EPA, the
19 information may be made available to the public by EPA without
20 further notice to Respondent. Respondent agrees not to assert
21 any confidentiality claim with regard to any geologic, hydrologic
22 or analytical data generated as part of the Work.

24 XIII. ACCESS

25 13.1. Respondent shall maintain access to the Facility, and
26 shall obtain access by written agreement with the current
27 owner(s) to any premises where Work is to be performed if such

1 premises are not owned or controlled by Respondent. Such
2 agreement(s), if any, shall provide access for EPA and its
3 designated representatives, and Respondent and its
4 representatives, and shall specify that Respondent is not EPA's
5 representative with respect to any liability associated with any
6 Work. Respondent shall use best efforts to obtain such access
7 within thirty (30) days after EPA approval of any Submittal
8 containing Work for which such access is necessary. Respondent
9 shall provide EPA's Project Coordinator with a copy of any such
10 access agreement(s) within seven (7) days after each agreement is
11 executed.

12 13.2. This Order does not convey any rights of access to
13 Respondent. Respondent's inability to obtain access to third
14 party property to perform a portion of the Work shall not be
15 construed to limit or otherwise affect Respondent's obligation to
16 perform any other Work required under this Order for which such
17 access is not necessary. Nothing in this Section shall be
18 interpreted as limiting or affecting EPA's rights of access or
19 entry, or its inspection authority under federal law.

20 13.3. If Respondent is unable to obtain any necessary access
21 despite its best efforts, Respondent shall notify EPA, in
22 writing, specifying its efforts to obtain such access. EPA may,
23 in its discretion, obtain access for Respondent, require
24 Respondent to submit a revised Workplan to modify the Work,
25 terminate this Order in whole or in part, and/or determine that
26 additional Work must be performed to address releases or threats
27 of releases of hazardous waste or hazardous constituents at or
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1 from the Facility. EPA shall not be affirmatively obligated to
2 exercise its discretion to obtain access for Respondent. If EPA
3 obtains access for Respondent, Respondent shall reimburse all
4 costs and attorney fees reasonably incurred by the United States
5 to obtain access.

6 13.4. EPA and its designated representatives shall be
7 permitted full access to the Facility and any other premises
8 where Work is to be performed, for purposes of inspecting or
9 observing Respondent's progress in implementing this Order,
10 verifying information submitted to EPA by Respondent, conducting
11 investigations relating to contamination at or from the Facility,
12 or for any purpose EPA determines to be related to EPA oversight
13 of the implementation of this Order, including photography and
14 video or audio recording of any activities. All such photographs
15 or video recordings will be developed and previewed by
16 Respondent, to enable Respondent to make a claim of
17 confidentiality as set forth in paragraph 12.3 above, when they
18 are submitted to EPA. Respondent may retain a copy of any such
19 photographs or video recordings. Respondent's Project
20 Coordinator or other representative may accompany EPA's
21 representative(s) at all times for purposes of Facility security,
22 and compliance with Facility and work area health and safety
23 precautions. If EPA or its representatives seek to perform their
24 duties at the Facility in a manner which is not in compliance
25 with any written Facility health and safety requirement or rule,
26 or any applicable federal or state law or promulgated regulation,
27 Respondent's Project Coordinator or other representative may
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1 verbally notify such EPA representative(s) of the non-compliance
2 and in such case may further notify EPA of such non-compliance in
3 writing. Respondent shall not be obligated, pursuant to Section
4 XXIII of this Order, to indemnify anyone for any injuries caused
5 by the failure to comply with the cited health and/or safety
6 requirement, rule, law or regulation. If EPA desires to obtain
7 access to any manufacturing or process areas which Respondent has
8 designated for conducting activities utilizing information which
9 is proprietary, Respondent may designate such areas as containing
10 confidential business information. If EPA desires to obtain
11 access to any manufacturing or process areas which Respondent has
12 designated for conducting activities utilizing secrets associated
13 with U.S. Department of Defense (DOD) projects, Respondent may
14 request a reasonable delay to providing such access so that
15 Respondent's and EPA's representatives may further confer
16 regarding the purpose of the inspection in the area and
17 appropriate precautions for protecting DOD secrets.

18 19 XIV. RECORDS PRESERVATION

20 14.1. Respondent shall retain, except as provided in
21 Attachment C, during the pendency of this Order and for a minimum
22 of six (6) years after its termination, all data, records, and
23 documents now in its possession or control, or which come into
24 its possession or control which relate to Work performed pursuant
25 to this Order. Respondent shall notify EPA in writing ninety
26 (90) days prior to the destruction of any such records, and shall
27 provide EPA with the opportunity to take possession of any such

1 records. Such written notification shall reference the effective
2 date, caption, and docket number of this Order and shall be
3 addressed to:

4 Director, Hazardous Waste Division
5 US EPA, Region 10
6 1200 Sixth Avenue, HW-111
7 Seattle, Washington 98101

8 14.2. Respondent further agrees that within thirty (30) days
9 after the later of the issuance of this Order or the retention of
10 any agent, consultant, or contractor for the purpose of
11 implementing any portion of this Order, Respondent will enter
12 into a written agreement with any such agents, consultants, or
13 contractors whereby such agents, consultants, and/or contractors
14 will be required to provide Respondent a copy of all documents
15 produced pursuant to this Order.

16 14.3. All documents required to be preserved under this
17 Order shall be stored by Respondent at Respondent's Facility in
18 Seattle, Washington, and shall be available for inspection by EPA
19 and its representatives.

20 14.4. This provision shall not be construed as a waiver by
21 Respondent of any attorney-client privilege or attorney work
22 product privilege properly asserted.

23 XV. NOTIFICATION AND DOCUMENT CERTIFICATION

24 15.1. Unless otherwise provided, all written notices of
25 approvals, disapprovals, noncompliance or other decisions by EPA
26 pursuant to this Order shall be effective upon receipt at the
27 office of the Respondent's Project Coordinator. Unless otherwise

1 provided, any written notices required by Respondent pursuant to
2 this Order shall be deemed effective upon receipt at the office
3 of EPA's Project Coordinator. All written notices shall be sent
4 by hand delivery, telefacsimile machine, overnight mail service
5 or U.S. certified mail, return receipt requested.

6 15.2. Submittals of draft reports for IM, RFI, CMS and CMI
7 shall be certified by a responsible corporate officer or a duly
8 authorized representative, as those persons are described in 40
9 C.F.R. §270.11.

10 15.3. The certification required by paragraph 15.2 above,
11 shall be in the following form:

12
13 "I certify under penalty of law that this document and all
14 attachments were prepared under my direction or supervision in
15 accordance with a system designed to assure that qualified
16 personnel properly gather and evaluate the information submitted.
17 Based on my inquiry of the person or persons who manage the
18 system, or those persons directly responsible for gathering the
19 information, the information submitted is, to the best of my
20 knowledge and belief, true, accurate, and complete. I am aware
21 that there are significant penalties for submitting false
22 information, including the possibility of fine and imprisonment
23 for knowing violations."

19 Signature: _____

20 Name: _____

21 Title: _____

22 Date: _____

24 XVI. DELAY IN PERFORMANCE/STIPULATED PENALTIES

25 16.1. Unless there is an excusable delay as defined in
26 Section XVIII: Force Majeure and Excusable Delay, or an
27

1 applicable written modification of a requirement by EPA, if
2 Respondent fails to comply with any requirement of this Order,
3 Respondent shall pay stipulated penalties as set forth below upon
4 written demand by EPA.

5 A. For failure to commence, perform, and/or complete field
6 work in the manner or by the time required by this Order;
7 and for failure to complete and submit any Workplans or
8 reports (other than progress reports, quality assurance
9 project plans, and health and safety plans) in the manner or
10 by the time required by this Order: \$500.00 per day for
11 each of the first seven (7) days of delay; \$1,000.00 per day
12 for the eighth (8th) through fourteenth (14th) days of
13 delay; \$5,000.00 per day for the fifteenth (15th) through
14 thirtieth (30th) days of delay; and \$10,000.00 for the
15 thirty-first (31st) through ninetieth (90th) days of delay.

16 B. For failure to complete and submit other written
17 Submittals not included in paragraph 16.1.A. of this Section
18 in the manner or by the time required pursuant to this
19 Order; and for failure to comply with any other provisions
20 of this Order in the manner required by this Order: \$250.00
21 per day for each of the first seven (7) days of delay;
22 \$500.00 per day for the eighth (8th) through fourteenth
23 (14th) days of delay; \$2,500.00 per day for the fifteenth
24 (15th) through thirtieth (30th) days of delay; and \$5,000.00
25 for the thirty-first (31st) through ninetieth (90th) days of
26 delay.

27 16.2. EPA may apply stipulated penalties in its discretion

1 to Work that is not of acceptable quality to EPA, consistent with
2 the relevant Workplan, or that is not submitted within the
3 specified time schedule approved under this Order. EPA may in
4 its discretion, waive imposition of stipulated penalties if it
5 determines that Respondent has attempted in good faith to comply
6 with this Order or in the event of timely cure of defects in
7 initial submissions. If assessed, penalties shall accrue from
8 the day after complete performance was due, or the day a
9 violation occurs, and shall continue to accrue through the day of
10 submittal or correction of the violation. Nothing herein shall
11 prevent the simultaneous accrual of separate stipulated penalties
12 for separate violations of this Order. Non-compliance due to the
13 unacceptable quality of a Workplan, report or other submittal
14 shall be deemed to occur no sooner than the date of EPA's notice
15 letter notifying Respondent of the non-compliance.

16 16.3. All penalties owed to the United States under this
17 Section shall be due and payable within sixty (60) days after
18 Respondent's receipt of a written demand for payment of the
19 penalties by EPA, unless Respondent invokes the dispute
20 resolution procedures in Section XVII, below. The written demand
21 will describe the violation and compute the penalty amount due.

22 16.4. Interest shall begin to accrue on any unpaid
23 stipulated penalty balance beginning on the sixty-first (61st)
24 day after Respondent's receipt of an EPA demand letter. Interest
25 shall accrue at the Current Value of Funds Rate established by
26 the Secretary of the Treasury. Pursuant to 31 U.S.C. § 3717, an
27 additional penalty of six (6) percent per annum on any unpaid
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1 principal shall be assessed for any stipulated penalty payment
2 which is overdue for ninety (90) or more days.

3 16.5. All penalties shall be made payable by check to the
4 Treasurer of the United States of America and shall be remitted
5 to:

6 U.S. Environmental Protection Agency
7 (Region 10)
P.O. Box 360903M
Pittsburgh, PA 15251

8 All such checks shall reference the name of the Facility,
9 Respondent's name and address, and the EPA docket number of this
10 Order. Copies of all checks and accompanying transmittal letters
11 shall be sent simultaneously to the EPA Project Coordinator and
12 to the Regional Hearing Clerk, EPA Region X, 1200 Sixth Avenue,
13 SO-155, Seattle, Washington 98101.

14 16.6. Respondent may dispute the assessment of stipulated
15 penalties by invoking the dispute resolution procedures in
16 Section XVII, below. Stipulated penalties shall continue to
17 accrue, but need not be paid, during the dispute resolution
18 process. Respondent shall pay stipulated penalties and interest,
19 if any, in accordance with the dispute resolution decision and/or
20 agreement. Respondent shall submit payment to EPA within forty-
21 five (45) days after receipt of an adverse decision in dispute
22 resolution.

23 16.7. Neither the invocation of dispute resolution nor the
24 payment of penalties shall in any way alter Respondent's
25 obligation to comply with this Order.

26 16.8. This Section shall not be construed to preclude EPA
27 from pursuing any other remedies or sanctions which may be

1 available to EPA by reason of Respondent's failure to comply with
2 this Order; however, EPA shall not seek to recover civil
3 penalties under Sections 3008(g) or (h)(2) for violations during
4 any period covered by an applicable stipulated penalty provision.

5 16.9. Payments made under this Section shall not be tax
6 deductible.

8 XVII. DISPUTE RESOLUTION

9 17.1. The parties shall try to resolve all disputes or
10 differences of opinion. The procedures in this Section are the
11 sole procedures for resolving disputes arising under this Order,
12 other than as provided for in Section X, above.

13 17.2. If Respondent disagrees, in whole or in part, with any
14 written decision by EPA ("Initial Written Decision"), including
15 EPA disapproval, comment, modification, or required modification
16 of a Submittal, Respondent shall notify EPA of the dispute within
17 fifteen (15) days after receipt of the Initial Written Decision
18 in a writing entitled "Notice of Dispute", which shall define the
19 dispute, and shall state the basis of Respondent's objections.

20 EPA and Respondent shall have fourteen (14) days from EPA's
21 receipt of Respondent's Notice of Dispute to resolve the matter
22 (unless the parties have already had an informal resolution
23 period for a dispute concerning a deliverable as set forth in
24 Section X of this Order, in which case no further amount of time
25 shall be allowed for informal dispute resolution). This fourteen
26 (14) day period may be extended by EPA for good cause. If an
27 agreement is not reached within this fourteen (14) day period, or

1 if there has already been an informal resolution period pursuant
2 to Section X, EPA shall issue a written determination of the
3 issues in dispute, which shall be labelled "EPA Decision" and
4 shall be signed by the EPA Region X RCRA Branch Chief.
5 Respondent shall proceed in accordance with the EPA Decision. If
6 Respondent fails to proceed or perform in accordance with the EPA
7 Decision, EPA may, in its discretion, conduct the disputed work
8 and seek reimbursement from Respondent, seek enforcement of the
9 EPA Decision, and/or assess stipulated penalties, and/or seek any
10 other appropriate relief.

11 17.3. EPA will maintain an administrative record for
12 disputes which shall include all correspondence and submittals
13 related to any dispute under this Section.

14 17.4. All EPA Decisions and written agreements by the
15 parties resolving disputes raised by a Notice of Dispute shall be
16 incorporated into and become an enforceable part of this Order.

17 17.5. Except as provided in Section XVI, above (Delay in
18 Performance/Stipulated Penalties), no dispute or process under
19 this Section shall excuse, toll, or suspend any obligation or
20 deadline under this Order.

21
22 XVIII. FORCE MAJEURE AND EXCUSABLE DELAY

23 18.1. "Force majeure", for purposes of this Order, is defined
24 as any event arising from causes beyond the control of Respondent
25 or any entity controlled by Respondent, including Respondent's
26 agents, consultants, contractors and subcontractors, which delays
27 the timely performance of any obligation under this Order

1 notwithstanding Respondent's best efforts to avoid such delay.
2 The requirement that Respondent use "best efforts to avoid the
3 delay" includes using best efforts to anticipate potential force
4 majeure events and using best efforts to address the effects of
5 any force majeure event (1) as it is occurring and (2) following
6 the potential force majeure event, such that the delay is
7 minimized to the greatest extent practicable. Examples of events
8 that are not force majeure events include, but are not limited
9 to, increased costs or expenses of any work to be performed under
10 this Order, or financial difficulty of Respondent to perform any
11 Work.

12 18.2. If any event occurs or has occurred which may delay the
13 performance of any Work under this Order, regardless of whether
14 caused by a force majeure event, Respondent shall orally notify
15 the EPA Project Coordinator or, in his or her absence, the Chief,
16 RCRA Compliance Section, EPA Region 10, within forty-eight (48)
17 hours after Respondent knew or should have known that any event
18 might cause a delay. Within seven (7) days thereafter,
19 Respondent shall submit the reasons for the delay to EPA in
20 writing, with the anticipated duration of the delay; all actions
21 taken or to be taken to prevent or minimize the delay; a schedule
22 for the implementation of any measures to be taken to mitigate
23 the effect of the delay; and a statement as to whether Respondent
24 believes the event may cause or contribute to an endangerment to
25 public health or the environment. Respondent shall exercise best
26 efforts to avoid or minimize any delay and any effects of any
27 delay.

1 18.3. If EPA agrees that the delay or anticipated delay is
2 attributable to force majeure, the time for performance of the
3 obligations under this Order that are directly affected by the
4 force majeure event shall be extended by EPA for a period based
5 upon the actual duration of the delay attributed to the force
6 majeure event. An extension of the time for performance of the
7 obligation directly affected by the force majeure event shall not
8 extend the time for performance of any other obligations except
9 as specified by EPA.

10 18.4. If EPA does not agree that the delay or anticipated
11 delay has been or will be caused by a force majeure event, or
12 does not agree with Respondent as to the appropriate length of
13 any extension due to force majeure, the issue shall be subject to
14 the dispute resolution procedures set forth in Section XVII of
15 this Order. In dispute resolution, Respondent shall have the
16 burden of demonstrating to EPA by a preponderance of the evidence
17 that the delay or anticipated delay has been or will be caused by
18 a force majeure event, that the duration of the delay was or will
19 be warranted under the circumstances, that Respondent did
20 exercise or is exercising due diligence by using its best efforts
21 to avoid and mitigate the effects of the delay, and that
22 Respondent has complied with all of the requirements of this
23 Section.

24 18.5. Should Respondent establish that a force majeure event
25 has occurred or will occur, the delay(s) at issue shall be deemed
26 not to be in violation of the affected obligation(s) of this
27 Order.

1 XIX. RESERVATION OF RIGHTS

2 19.1. EPA reserves all of its statutory and regulatory
3 powers, authorities, rights, and remedies, regarding any failure
4 by Respondent to comply with this Order, including, without
5 limitation, the assessment of penalties under Section 3008(h)(2)
6 of RCRA, 42 U.S.C. § 6928(h)(2). This Order shall not be
7 construed as a covenant not to sue, a release, a waiver, or a
8 limitation of any rights, remedies, powers, and/or authorities,
9 civil or criminal, by EPA under RCRA, CERCLA, or any other lawful
10 authority.

11 19.2. EPA reserves the right to disapprove of Work performed
12 by Respondent pursuant to this Order and to request that
13 Respondent perform additional Work, as set forth in this Order.

14 19.3. EPA reserves the right to perform any portion of the
15 Work consented to herein or any additional site characterization,
16 remedy feasibility study, and remedial work as it deems necessary
17 to protect human health or the environment in the event that
18 Respondent fails to do so under the terms of this Consent Order.
19 EPA may exercise its authority under CERCLA to undertake response
20 actions at any time, and EPA reserves its right to seek
21 reimbursement from Respondent for costs incurred by the United
22 States. Notwithstanding compliance with this Order, Respondent
23 is not released from liability, if any, for the costs of any
24 response actions taken or authorized by EPA.

25 19.4. If EPA determines that Respondent's activities in
26 compliance or noncompliance with this Order have caused or may
27 cause a release of hazardous waste or hazardous constituent(s),

1 or a threat to human health or the environment, or that
2 Respondent is not capable of undertaking any Work, EPA may order
3 Respondent to stop further implementation of this Order for such
4 time as EPA determines may be necessary. Any such directive
5 shall be issued by EPA in writing, stating the reasons therefor.
6 This determination is not subject to Section XVII (Dispute
7 Resolution), except as to any EPA determination that Respondent
8 is not capable of undertaking the Work.

9 19.5. This Order is not intended to be and shall not be
10 construed to be a permit. The parties acknowledge and agree that
11 EPA's approval of any Submittal does not constitute a warranty or
12 representation that any Submittal will achieve the required
13 result or performance standards. Compliance by Respondent with
14 this Order shall not relieve Respondent of its obligations to
15 comply with RCRA or any other applicable local, State, or federal
16 laws and regulations.

17 19.6. In any action brought by EPA for a violation of this
18 Order, Respondent shall bear the burden of proving that any EPA
19 action was improper under the applicable legal standard.

20 19.7. In any administrative or judicial proceeding initiated
21 by the United States for injunctive or other appropriate relief
22 to enforce this Order, Respondent shall not assert, and may not
23 maintain, any defense or claim based upon the principles of
24 waiver, res judicata, collateral estoppel, issue preclusion,
25 claim-splitting, or other defenses based upon any contention that
26 the claims raised by the United States were or should have been
27 raised in the present matter.

1 19.8. Subject to Sections I and IV of this Order, Respondent
2 does not admit any liability, violation of law, or factual or
3 legal findings, conclusions, or determinations made by EPA under
4 this Order.

5 19.9. Nothing in this Order is intended to create any cause
6 of action in favor of any person who is not a signatory to this
7 Order.

8 19.10. Nothing in this Order shall prevent Respondent from
9 bringing any cause of action or exercising any rights of
10 contribution or indemnification Respondent might have against any
11 person other than EPA and its agents, regarding activities under
12 this Order.

13 19.11. This Order may not be used in any collateral
14 litigation by any third party.

15
16 XX. JUDICIAL REVIEW

17 Respondent shall not seek judicial review of this Order in
18 any action except an action by the United States to: 1) enforce
19 this Order; 2) recover costs incurred in connection with this
20 Order; or 3) compel action relating to the releases of hazardous
21 wastes and/or constituents. Judicial review of this Order shall
22 be limited to the administrative record. Applicable principles
23 of administrative law shall otherwise govern such proceedings.
24 Nothing in this paragraph shall limit any action by Respondent
25 against any party to recover costs incurred in implementing this
26 Order, or for damages or contribution pursuant to Section 107 of
27 CERCLA, 42 U.S.C. § 9607, or other applicable law; or any action

1 pursuant to Section 310 of CERCLA, 42 U.S.C. § 9659, or Section
2 7002 of RCRA, 42 U.S.C. § 6972.

4 XXI. OTHER CLAIMS

5 Nothing in this Order shall constitute or be construed as a
6 release from any claim, cause of action, demand, or defense in
7 law or equity, against any person for any liability arising out
8 of or relating in any way to the generation, storage, treatment,
9 handling, transportation, release, or disposal of any hazardous
10 constituents, hazardous substances, hazardous waste, pollutants,
11 or contaminants at or from the Facility. Respondent waives any
12 claims or demands for compensation or payment under Sections
13 106(b), 111, and 112 of CERCLA, 42 U.S.C. §§ 9606(b), 9611, and
14 9612, against the United States or the Hazardous Substance
15 Superfund established by 26 U.S.C. § 9507 for, or arising out of,
16 any Work performed or expense incurred pursuant to this Order.
17 This Order does not constitute any decision on preauthorization
18 of funds under Section 111(a)(2) of CERCLA, 42 U.S.C. §
19 9611(a)(2).

21 XXII. OTHER APPLICABLE LAWS

22 All Work required by this Order shall be undertaken in
23 accordance with the requirements of all applicable local, state,
24 and Federal laws and regulations. Respondent shall obtain or
25 cause its representatives to obtain all permits and approvals
26 necessary under such laws and regulations.

1 XXIII. INDEMNIFICATION OF THE UNITED STATES

2 Respondent agrees to indemnify and save and hold harmless
3 the United States, its agencies, departments, agents, and
4 employees, from any and all claims or causes of action arising
5 from or on account of acts or omissions of Respondent or its
6 officers, employees, agents, independent contractors, receivers,
7 trustees, and assigns in carrying out Work required by this
8 Order. This indemnification shall not be construed in any way as
9 affecting or limiting the rights or obligations of Respondent or
10 the United States under their various contracts. EPA agrees to
11 timely notify Respondent of any claim served upon the United
12 States for which the United States may seek indemnification
13 pursuant to this Section, to enable Respondent to timely contest
14 or litigate such claim(s).

15
16 XXIV. FINANCIAL RESPONSIBILITY

17 24.1. Within thirty (30) days after issuance of this Order,
18 Respondent shall establish and submit evidence of financial
19 responsibility in the amount of twenty million dollars
20 (\$20,000,000.00) using one of the mechanisms described in Section
21 24.4 of this Order.

22 24.2. Respondent shall adjust the amount of financial
23 assurance provided hereunder annually as appropriate to maintain
24 levels of assurance equal to or greater than the anticipated cost
25 of completing corrective action at the Facility. Respondent
26 shall submit evidence of financial responsibility for any such
27 adjusted amount within 120 days of the end of Respondent's fiscal

1 year.

2 24.3. Respondent shall also adjust the amount of financial
3 assurance provided hereunder as appropriate to maintain levels of
4 assurance equal to or greater than the total capital operating
5 and maintenance cost estimate submitted to EPA with the final
6 CMI design submittal. Respondent shall submit evidence of
7 financial responsibility for any such adjusted amount within
8 sixty (60) days after EPA approval of the final CMI design
9 submittal.

10 24.4. During the pendency of this Order, Respondent shall
11 continuously maintain financial assurance for performance of
12 corrective action at the Facility in accordance with this
13 Section. The mechanism(s) for obtaining and demonstrating
14 financial assurance for corrective action must be one of the
15 forms specified in Paragraphs (a) through (g) of 40 C.F.R. §
16 265.143.

18 XXV. MODIFICATION

19 25.1 This Order may be modified by mutual agreement by EPA
20 and Respondent. Any agreed modifications shall be in writing, be
21 signed by both parties, shall be effective when signed by EPA,
22 and shall be incorporated into this Order.

23 25.2 Any requests for a compliance date modification or
24 revision of an approved Workplan requirement must be made in
25 writing. Such requests must provide justification for any
26 proposed compliance date modification or workplan revision. EPA
27 has no obligation to approve such requests, but if it does so,

1 such approval must be in writing, and may be in the form of a
2 letter from EPA.

3 25.3 EPA may extend time schedules and deadlines as it may
4 deem appropriate. Such extensions must be in writing.
5

6 XXVI. SEVERABILITY

7 If any provision or authority of this Order or the
8 application of this Order to any party or circumstances is held
9 by any judicial or administrative authority to be invalid, the
10 application of such provisions to other parties or circumstances
11 and the remainder of the Order shall remain in force and shall
12 not be affected thereby.
13

14 XXVII. TERMINATION AND SATISFACTION

15 This Order shall be deemed satisfied upon Respondent's and
16 EPA's execution of an "Acknowledgment of Termination and
17 Agreement to Record Preservation and Reservation of Rights"
18 ("Acknowledgment"). EPA will prepare the Acknowledgment for
19 Respondent's signature. The Acknowledgment will specify that
20 Respondent has demonstrated to EPA satisfaction that this Order,
21 including any additional Work required by EPA, has been
22 satisfactorily completed. Respondent's execution of the
23 Acknowledgement will affirm Respondent's continuing obligation
24 (1) to preserve all records and (2) to recognize EPA's continuing
25 reservation of rights.
26
27

1 ACKNOWLEDGMENT OF TERMINATION and
2 AGREEMENT TO RECORD PRESERVATION AND RESERVATION OF RIGHTS

3 1. The United States Environmental Protection Agency
4 ("EPA") agrees and acknowledges that the Administrative Order on
5 Consent, EPA Docket No. 1902-01-22-3008(h), issued by EPA on
6 _____, 19____ ("the Order"), including any additional
work required by EPA pursuant to the Order, has been
satisfactorily completed based upon the information presently
available to EPA.

7 2. Respondent agrees and acknowledges that Section XIV of
8 the Order, entitled: Records Preservation remains in effect until
_____. [Insert date 6 years after termination of
Order.]

9 3. Respondent agrees and acknowledges that Respondent's
10 completion of the Work required by the Order does not limit or
11 otherwise preclude EPA from taking additional enforcement action
12 pursuant to the Solid Waste Disposal Act, also known as the
Resource Conservation and Recovery Act, as amended ("RCRA"), 42
U.S.C. §6901 et seq., or other applicable authorities, should EPA
determine such action is warranted.

13 4. Respondent agrees and acknowledges that Respondent's
14 completion of the work required by the Order does not relieve
15 Respondent of its obligations to comply with RCRA or all other
applicable local, state, or federal laws and regulations.

16 IT IS SO AGREED AND ACKNOWLEDGED:

17 Date: _____ By: _____
18 RESPONDENT

19
20 Date: _____ By: _____
21 DIRECTOR
HAZARDOUS WASTE DIVISION
22 U.S. EPA, REGION 10
23
24
25
26
27

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2 XXVIII. SURVIVABILITY/PERMIT INTEGRATION

3 Except as otherwise expressly provided in this Section, this
4 Order shall survive the issuance or denial of a RCRA permit for
5 the Facility, and this Order shall continue in full force and
6 effect after either the issuance or denial of any permit.
7 Accordingly, Respondent shall continue to be liable for the
8 performance of obligations under this Order notwithstanding the
9 issuance or denial of any permit. If the Facility is issued a
10 RCRA permit and that permit expressly incorporates all or a part
11 of the requirements of this Order, or expressly states that its
12 requirements are intended to replace some or all of the
13 requirements of this Order, Respondent may request a modification
14 of this Order and shall, with EPA approval, be relieved of
15 liability under this Order for those specific obligations.
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2 XXIX. ISSUANCE

3 This Order shall be issued on the date on which it is signed
4 by the EPA Region X, Hazardous Waste Division Director and
5 effective five (5) days thereafter.

6 IT IS SO AGREED AND ORDERED:


7 DATE: 1/14/94

8 BY:


JOHN A. JOHNSON, VICE-PRESIDENT
Corporate Safety, Health and
Environmental Affairs
The Boeing Company

9
10
11 DATE: 1/18/94

12 BY:


RANDALL F. SMITH, DIRECTOR
Hazardous Waste Division, Region 10
U.S. Environmental Protection Agency

Source: the Boeing Company June 11, 1993

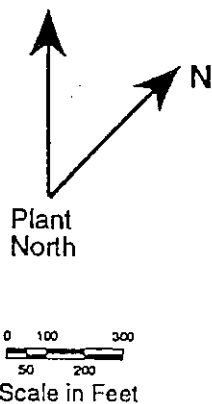
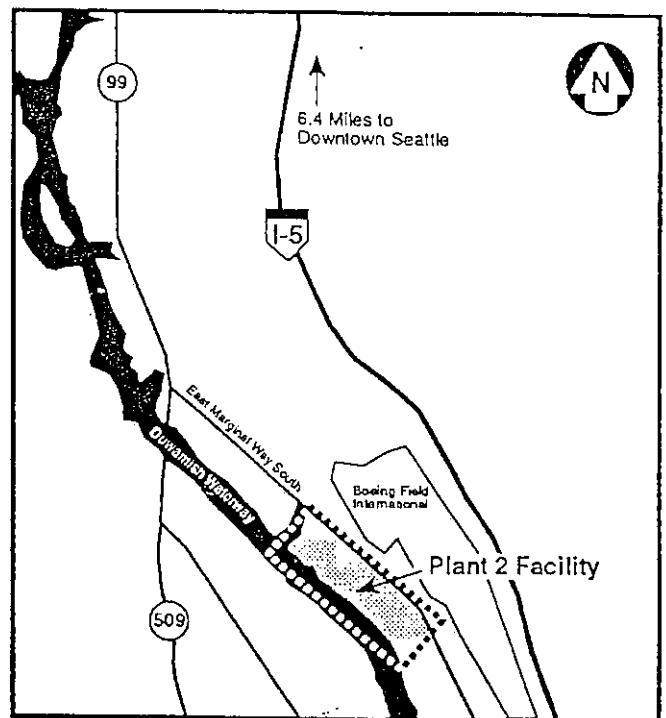
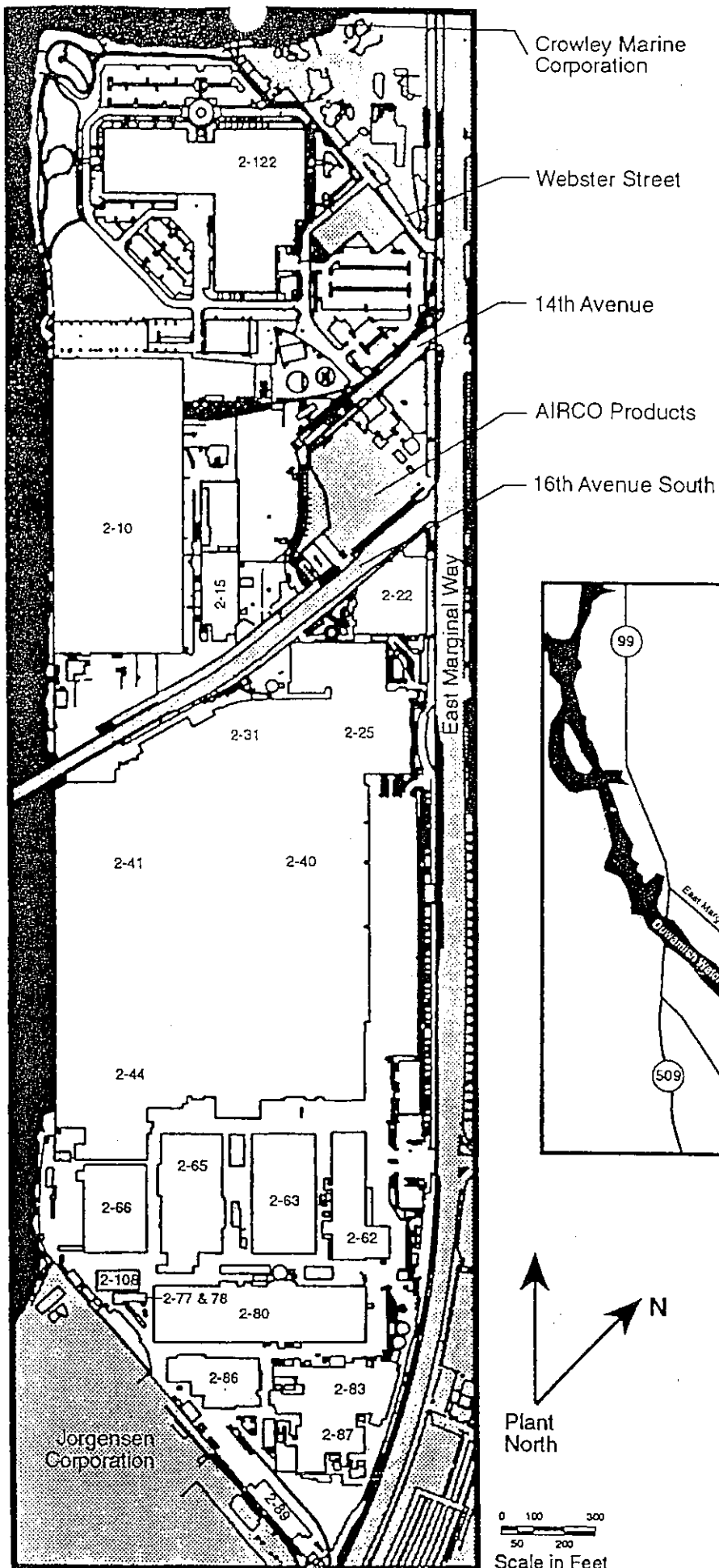


FIGURE 1
Facility Boundary
Boeing Plant 2

NOTE: For building number references see table 1

TABLE 1

DESCRIPTION OF UNITS AT BOEING PLANT 2 FACILITY

Source: Boeing, undated

Building Code	Building Title	Building Code	Building Title
2-01	Laboratory and Office Building First Floor Mezzanine Balcony Second Floor	2-31	North Warehouse First Floor Balconies
2-02	High-Temperature Test Cell	2-32	Dispatch Station
2-03	Chiller House	2-34	Guard House - Boeing Computer Center
2-05	Gas Pump Building	2-35	Boeing Computer Center First Floor Second Floor Penthouse
2-06	Guard House 2-01 Ramp Gate	2-40	Final Assembly Building First Floor Mezzanine
2-08	Dennison Manufacturing Building	2-41	Primary Building First Floor First Floor Mezzanine Second Floor Second Floor Mezzanine
2-09	Butler Building	2-43	Tunnels and Underground Areas
2-10	Material and Fabrication Building North Half South Half Balconies	2-44	South Warehouse First Floor Balconies Mezzanine
2-11	Water Pump House - North Property	2-48	Factory Material Handling Terminal and Storage
2-12	Acid Storage Building - North Property	2-49	Jig Erection Building First Floor Second Floor
2-13	Oil Pump House - North Property	2-50	Maintenance Storage
2-14	Guard House Gates B-60 and B-62	2-51	Box Storage and Shoring
2-15	Plant Services Terminal Building First Floor Balconies	2-52	Beryllium Waste Storage Building - Ref. Only
2-16	Guard House Gates B-56 and B-58	2-57	Guard House South Clock Aisle
2-18	Acid Storage	2-59	Flammable Storage Building
2-19	Guard House Gate C-16	2-61	South Electrical Equipment Building
2-22	Cafeteria Building	2-62	Camouflage Building
2-23	Guard House Gate B-34	2-63	Support Building Annex A First Floor Balcony
2-24	Administration Building Basement First Floor Second Floor Third Floor	2-64	Compressor House
2-25	Engineering Building Basement First Floor Second Floor Third Floor Fourth Floor Fifth Floor Penthouse	2-65	Annex B First Floor Balcony
2-26	Guard House North Clock Aisle Gate B-42	2-66	Annex C
2-27	Emergency Generator Building	2-68	South Storage and Pump House
2-69	Services Support Building	2-98	Guard House Gate B-6
2-70	Sandblasting Building	2-99	Plant Services Maintenance Building
2-71	City Light Substation	2-102	Dunnage Storage Building
2-72	Steel Storage Building	2-103	Bottled Gas and Acid Storage
2-74	Steel Yard Only	2-104	Hazardous Waste Storage
2-75	Trichlorethylene Storage Building	2-106	Oil Storage Building
2-78	Cement Storage Building	2-108	Plant Services Paint Building First Floor Second Floor
2-80	Annex D First Floor Balconies	2-109	Hypersonic Wind Tunnel
2-82	Paint Storage Building	2-110	Compressor Building
2-83	Aerodynamics Building Basement First Floor Second Floor Second Floor Mezzanine	2-112	Guardhouse Gate B-32
2-84	Wind Tunnel Annex	2-114	Guardhouse Gate B-18
2-86	Foundry Building	2-115	Material Handling Dispatch
2-87	South Service Building First Floor Balcony	2-116	Wind Tunnel First Floor Second Floor
2-89	Salvage Building	2-117	Compressor House First Floor Second Floor
2-95	Refrigerated Storage Building	2-118	Car Unloading Facility - Ref. Only
2-96	Radioactive Waste Vault	2-282	Production Sandblasting Building
2-97	Radioactive Waste Vault		
2-28	North Boiler House		
2-29	North Pump House		
2-30	North Electrical Equipment House		

TABLE 2

HAZARDOUS WASTES GENERATED AT BOEING PLANT 2

Waste Description	Use/Origin	Waste Characteristic	Possible Waste Code	
			RCRA	Ecology
Flammable solvents	Parts cleaning paint stripping	Ignitable (flammable, combustible), determined by flashpoint	D001, F003, F005	
Flammable adhesives, sealants, and paints	Paint shops, Composite shops	Ignitable (flammable, combustible)	D001	
Corrosive metals, cyanides, acids, and caustics	2-10, 2-41, and 2-31 Plating and Metal Buildings	Corrosive, toxic	D002, D007, F007	WT02
Chlorinated solvent	Degreasing	Toxic	F001	
Combustible waste	Machinery oil hydraulic fluids	Ignitable	D001	WT02
Wastewater effluent	2-09 Bldg. Ion Exchange Evaporator	Corrosive, toxic	D002	WT02
Process waste laboratory chemicals	Laboratories	Various	Various	Various

RCRA - Resource Conservation and Recovery Act

Ecology - Washington Department of Ecology

ATTACHMENT A

SCOPE OF WORK FOR CORRECTIVE MEASURE STUDY

PURPOSE

The purpose of this Corrective Measure Study (CMS) is to develop and evaluate corrective action alternatives and to recommend corrective measure(s) to be taken at the Facility.

SCOPE

The scope of the CMS will depend on the needs at the Facility as determined by the RFI; EPA may determine that an abbreviated CMS is sufficient for the Facility. In general, the CMS will consist of the following four tasks:

Task 1. Identification and Development of the Corrective Measure Alternatives

- A. Description of Current Situation
- B. Establishment of Corrective Action Objectives
- C. Identification of SWMUs/Areas of Concern for Focused CMS
- D. Screening of Corrective Measures Technologies
- E. Identification of the Corrective Measure Alternatives

Task 2. Evaluation of the Corrective Measure Alternatives

- A. Technical/Environmental/Human Health/Institutional
- B. Cost Estimate

Task 3. Justification and Recommendation of the Corrective Measure(s)

- A. Technical
- B. Environmental
- C. Human Health

Task 4. Reports

- A. Draft
- B. Final

TASK 1: IDENTIFICATION AND DEVELOPMENT OF THE CORRECTIVE ACTION ALTERNATIVES

Based on the results of the RFI, Respondent shall identify, screen, and develop the alternatives for removal, containment, treatment, and/or other remediation of the contamination based on the objectives established for the corrective action.

A. Description of Current Situation

Respondent shall submit an update to the information describing the current situation at the Facility and the known nature and extent of the contamination as documented by the RFI. Respondent shall also make a Facility-specific statement of the purpose for the response, based on the results of the RFI. The statement of purpose should identify the actual or potential exposure pathways that should be addressed by corrective measures.

B. Establishment of Corrective Action Objectives

Respondent shall propose Facility-specific objectives for the corrective action, utilizing the target media cleanup levels and points of compliance established by EPA as provided in Section 8.12 of this Order, and with consideration to all applicable State and federal statutes, regulations and permit requirements.

C. Identification of SWMUs/Areas of Concern for Focused CMS

As appropriate, Respondent may identify those SWMUs and/or Areas of Concern, or groups thereof, for which a highly focused CMS is to be conducted, as provided in Task 1 (E) below. As to those SWMUs and/or Areas of Concern, screening of technologies provided in Task 1 (D) shall not be required.

D. Screening of Corrective Measure Technologies

Respondent shall identify technologies which are potentially appropriate for achieving corrective action objectives at the Facility. Respondent shall screen corrective measure technologies and any supplemental technologies to eliminate those that may prove infeasible to implement, that rely on technologies unlikely to perform satisfactorily or reliably, or that could not achieve the corrective measure objectives within a reasonable time period. This screening process focuses on eliminating those technologies which have substantial limitations for a given set of waste and Facility-specific conditions. The screening step may also eliminate technologies based on inherent technology

limitations.

Facility, waste, and technology characteristics which are used to screen inapplicable technologies are described in more detail below:

1. Facility Characteristics

Facility data should be reviewed to identify conditions that may limit or promote the use of certain technologies. Technologies whose use is clearly precluded by Facility characteristics should be eliminated from further consideration.

2. Waste Characteristics

Identification of waste characteristics that limit the effectiveness or feasibility of technologies is an important part of the screening process. Technologies clearly limited by waste characteristics at the Facility may be eliminated from consideration. Waste characteristics particularly affect the feasibility of on-site and in-situ methods, direct treatment methods, and land disposal; and

3. Technology Limitations

During the screening process the level of technology development, performance record, and inherent construction, operation, and maintenance problems should be identified for each technology considered. Technologies that are unreliable, perform poorly, or are not fully demonstrated may be eliminated in the screening process.

E. Identification of Corrective Measure Alternatives

Respondent shall develop the corrective measure alternative or alternatives based on the corrective action objectives and analysis of corrective measure technologies. Respondent shall rely on engineering practice to determine which of the identified technologies appear most suitable for the site. Technologies can be combined to form the overall corrective action alternative or alternatives. The alternative or alternatives developed should represent a workable number of option(s) that each appear to adequately address all site problems and corrective action objectives. Each alternative may consist of an individual technology or a combination of technologies. Respondent may propose to conduct a highly focused CMS considering a single or relatively few alternatives where appropriate in light of the proposed corrective measure(s) and the complexity of necessary

remediation. Respondent shall document the reasons for excluding technologies.

TASK 2: EVALUATION OF THE CORRECTIVE MEASURE ALTERNATIVE OR ALTERNATIVES

Respondent shall describe each corrective measure alternative that passes through the initial screening in Task 1 and evaluate each corrective measure alternative and its components. The evaluation shall be based on technical, environmental, human health, and institutional concerns. Respondent shall also develop cost estimates of each corrective measure.

A. General Standards for Remedies

Respondent must demonstrate that proposed corrective action remedies meet the following standards:

- Are protective of human health and the environment;
- Are designed to attain EPA-established target media cleanup levels, to the extent practicable;
- Control the sources of releases so as to reduce or eliminate, to the extent practicable, further releases that may pose a threat to human health and the environment; and
- Comply with all applicable standards for management of wastes.

B. Remedy Selection Decision Factors

The following five factors shall be considered by Respondent and by EPA, as appropriate, in proposing and selecting a remedy that meets the four General Standards for remedies, and that represent an appropriate combination of technical measures and management controls for addressing the environmental problems at the Facility:

- Long-term reliability and effectiveness;
- Reduction of toxicity, mobility or volume of wastes;
- Short-term effectiveness;
- Implementability; and
- Cost.

While it is EPA's policy that all four of the General Standards for remedies must be met, it is expected that

there will be trade-offs among the importance of the five Decision Factors depending on Facility-specific characteristics which will affect the relative weights assigned to each factor.

TASK 3: JUSTIFICATION AND RECOMMENDATION OF CORRECTIVE MEASURES

Respondent shall justify and recommend a corrective measure or measures based on the information from Tasks 1 and 2. This recommendation shall include summary tables which allow the alternatives to be understood easily. Trade-offs among health risks, environmental effects, and other pertinent factors shall be highlighted. EPA will select the corrective measure(s) to be implemented based on the results of Tasks 2 and 3.

TASK 4: REPORTS

Respondent shall prepare a Corrective Measure Study Report presenting the results of Tasks 1 through 3 and recommending a corrective measure or measures.

A. Draft

The Report shall, at a minimum, include:

1. A description of the Facility
 - a. Site topographic map and preliminary layouts
2. A summary of the corrective measure(s):
 - a. Description of the corrective measure or measures and rationale for selection;
 - b. Performance expectations;
 - c. Preliminary design criteria and rationale;
 - d. General operation and maintenance requirements; and
 - e. Long-term monitoring requirements.
3. A summary of the RFI and impact on the selected corrective measure or measures:
 - a. Field studies (ground water, surface water, soil, air); and
 - b. Treatability studies, if any (bench scale, pilot scale).
4. Design and Implementation Precautions:

- a. Special technical problems;
 - b. Additional engineering data required;
 - c. Permits and regulatory requirements;
 - d. Access, easement, right-of-way; and
 - e. Health and safety requirements.
5. Cost Estimates and Schedules:
- a. Capital cost estimate;
 - b. Operation and maintenance cost estimate; and
 - c. Project schedule (design, construction, operation).

B. Final

Respondent shall prepare and submit a final Corrective Measure Study Report incorporating comments received from EPA on the Draft Corrective Measure Study Report, as set forth in Section X of the Order.

ATTACHMENT B

SCOPE OF WORK FOR THE CORRECTIVE MEASURE IMPLEMENTATION

PURPOSE

The purpose of this Corrective Measure Implementation (CMI) program is to design, construct, operate, maintain, and monitor the performance of the corrective measure(s) selected to protect human health and the environment.

SCOPE

The scope of the Corrective Measure Implementation program will depend on the needs of the Facility as determined by the Corrective Measures Study. In general, the Corrective Measure Implementation program will consist of the following four tasks:

Task 1. Corrective Measure Implementation Workplan

Task 2. Corrective Measure Design

- A. Design Plans and Specifications
- B. Operation and Maintenance Plan
- C. Cost Estimate
- D. Project Schedule
- E. Construction Quality Assurance Objectives
- F. Design Phases

Task 3. Corrective Measure Construction

- A. Responsibility and Authority
- B. Construction Quality Assurance Personnel Qualifications
- C. Inspection Activities
- D. Sampling Requirements
- E. Documentation

Task 4. Reports

- A. Progress
- B. Draft
- C. Final

TASK 1: CORRECTIVE MEASURE IMPLEMENTATION WORKPLAN

Respondent shall prepare a Corrective Measure Implementation Workplan. This program will describe the CMI program which will include the development and implementation of several plans, which require concurrent preparation. It may be necessary to revise plans as the work is performed to focus efforts on a particular problem. The CMI Workplan includes the following:

The CMI Workplan will document the overall management strategy for performing the design, construction, operation, maintenance, and monitoring of corrective measure(s). The plan shall document the responsibility and authority of Respondent's representatives, consultants, contractors and their subcontractors involved with the implementation. The Workplan will also set forth a schedule for conducting Task 2 and Task 3 activities hereunder.

TASK 2: CORRECTIVE MEASURE DESIGN

Respondent shall prepare final construction plans and specifications to implement the corrective measure(s) at the Facility as defined in the CMS.

A. Design Plans and Specifications

Respondent shall develop clear and comprehensive design plans and specifications which may include, as appropriate, the following:

1. Discussion of the design strategy and the design basics, including:
 - a. Compliance with all applicable environmental and public health standards; and
 - b. Minimization of environmental and public impacts.
2. Discussion of the technical factors of importance including:
 - a. Use of currently accepted environmental control measures and technology;
 - b. The constructability of the design; and
 - c. Use of currently acceptable construction practices and techniques.
3. Description of assumptions made and detailed justification of these assumptions;

4. Discussion of the possible sources of error and references to possible operation and maintenance problems;
5. Detailed drawings of the proposed design;
6. Tables listing equipment and specifications;
7. Appendices including:
 - a. Sample calculations (one example presented and explained clearly for significance or unique design calculations);
 - b. Results of laboratory or field tests.

B. Operation and Maintenance Plan

Respondent shall prepare an Operation and Maintenance Plan to cover both implementation and long-term maintenance of the corrective measure. The plan shall be composed of the following elements as appropriate:

1. Description of alternate operation and maintenance:
 - a. Should systems fail, alternate procedures to prevent undue hazard; and
 - b. Analysis of vulnerability and additional resource requirements should a failure occur.
2. Safety Plan:
 - a. Description of precautions, or necessary equipment, etc., for site personnel; and
 - b. Safety tasks required in event of systems failure.
3. Description of equipment; and
 - a. Equipment identification;
 - b. Installation of monitoring components;
 - c. Maintenance of site equipment; and
 - d. Replacement schedule for equipment and installed components.
4. Records and reporting mechanisms required.
 - a. Operating logs;

- b. Laboratory records;
- c. Mechanism for reporting emergencies; and
- d. Personnel and maintenance records.

C. Cost Estimate

Respondent shall develop cost estimates for the purpose of assuring that the Facility has the financial resources necessary to construct and implement the corrective measure(s). The cost estimate developed in the CMS shall be refined to reflect the more detailed/accurate design plans and specifications being developed. The cost estimate shall include both capital and operation and maintenance costs. A Cost Estimate shall be submitted simultaneously with the Final Design Document.

D. Project Schedule

Respondent shall develop a Project Schedule for construction and implementation of the corrective measure(s) which identifies timing for initiation and completion of all critical path tasks. Respondent shall specifically identify dates for completion of the project and major interim milestones. An Initial Project Schedule shall be submitted simultaneously with the Prefinal Design Document submission, if any, and the final Project Schedule with the Final Design Document.

E. Construction Quality Assurance Objectives

Respondent shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to, the following: responsibility and authority; personnel qualifications; inspection activities; sampling requirements; and documentation.

F. Design Phases

The design of the corrective measure(s) should include the phases outlined below, as appropriate:

1. Preliminary Design

Respondent shall submit the preliminary design when the design effort is approximately 30 percent complete. At this stage, Respondent shall have field verified the existing conditions of the Facility. The preliminary design shall reflect a level of effort such that the technical requirements of the project have been

addressed and outlined so that they may be reviewed to determine if the final design will provide operable and usable corrective measure(s). Supporting data and documentation shall be provided with the design documents defining the functional aspects of the program. The scope of the technical specifications shall be outlined in a manner reflecting the final specifications. Respondent shall include with the preliminary submission, design calculations reflecting the same percentage of completion as the designs they support.

2. Correlating Plans and Specifications

General correlation between drawings and technical specifications, is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, Respondent shall:

- a. Coordinate and cross-check the specifications and drawings; and
- b. Complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

These activities shall be completed prior to the 95 percent prefinal submittal to EPA, if any, otherwise prior to the final design submittal.

3. Equipment Start-up and Operator Training

Respondent shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, start-up, and operation of the treatment systems, and training covering appropriate operations procedures once the start-up has been successfully accomplished.

4. Additional Studies

If EPA determines that Corrective Measure Implementation requires additional studies to supplement the available technical data, Respondent shall propose the scope and method for performance of any such study in the CMI Workplan, as well as a schedule for conducting the study, reporting the results and incorporating the results into the corrective measure design.

5. Prefinal and Final Design

Respondent shall submit the prefinal/final design documents in two parts, if appropriate given the complexity of the selected remedy (otherwise only the final design must be submitted for approval). The first submission shall be at 95 percent completion of design (i.e., prefinal). After approval of the prefinal submission, Respondent shall execute the required revisions and submit the final documents 100 percent complete with reproducible drawings and specifications.

The prefinal design submittal shall consist of the Design Plans and Specifications, Operation and Maintenance Plan, Project Schedule, and Construction Quality Assurance Program Plan.

The final design submittal shall consist of the Final Design Plans and Specifications (100 percent complete), Respondent's Final Construction Cost Estimate, the final Operation and Maintenance Plan, Final Construction Quality Assurance Program Plan, and Final Project Schedule. The quality of the design documents should be such that the Respondent would be able to include them in a bid package and invite contractors to submit bids for the construction project.

TASK 3: CORRECTIVE MEASURE CONSTRUCTION

Following EPA approval of the final design, Respondent shall develop and implement a construction quality assurance (CQA) program to ensure, with a reasonable degree of certainty, that the completed corrective measure(s) meets or exceeds all design criteria, plans, and specifications. The CQA plan is a facility specific document which must be submitted to EPA for approval prior to the start of construction. At a minimum, the CQA plan should include the elements summarized below. Upon EPA approval of the CQA plan, the Respondent shall construct and implement the corrective measure in accordance with the approved design, schedule, and the CQA plan. The Respondent shall also implement the elements of the approved Operation and Maintenance plan.

A. Responsibility and Authority

The responsibility and authority of all organizations (e.g., technical consultants, construction firms, etc.) and key personnel involved in the construction of the corrective measure(s) shall be described fully in the CQA plan. Respondent must identify a CQA officer and the necessary supporting inspection staff.

B. Construction Quality Assurance Personnel Qualifications

The qualifications of the CQA officer and supporting inspection personnel shall be presented in the CQA plan to demonstrate that they possess the training and experience necessary to fulfill their identified responsibilities.

C. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the corrective measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements. The inspection should also verify compliance with all health and safety procedures.

D. Sampling Requirements

The sampling activities, sample size, sample locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems as addressed in the project specifications should be presented in the CQA plan.

E. Documentation

Reporting requirements for CQA activities shall be described in detail in the CQA plan. This should include such items as summary reports, inspection data sheets, problem identification and corrective measures reports, design acceptance reports, and final documentation. Provisions for the final storage of all records also should be presented in the CQA plan.

TASK 4: REPORTS

Respondent shall prepare plans, specifications, and reports as set forth in Tasks 1 through 3 to document the design, construction, operation, maintenance, and monitoring of the corrective measure. The documentation shall include, but not be limited to, the following:

A. Progress

Respondent shall provide EPA and Ecology with periodic progress reports during the design and construction phases on the submittal schedule approved by EPA. The progress reports shall contain:

1. A description and estimate of the percentage of the CMI completed;
2. Summaries of all findings;
3. Summaries of all changes in the CMI during the reporting period;
4. Summaries of all contacts with representatives of the local community, public interest groups or state government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of inspection reports, laboratory/monitoring data, etc.

B. Draft

1. Respondent shall submit a draft Corrective Measure Implementation Workplan as outlined in Task 1.
2. Respondent shall submit draft Construction Plans and Specifications, Design Reports, Schedules, Operation and Maintenance plans, and Study Reports as outlined in Task 2.
3. Respondent shall submit a draft Construction Quality Assurance Program Plan and Documentation as outlined in Task 2.

c. Final

Respondent shall submit final versions of the Corrective Measure Implementation Workplan, Construction Plans and Specifications, Design Reports, Cost Estimate, Project Schedule, Operation and Maintenance Plan, Study Reports, Construction Quality Assurance Program Plan/Documentation, and the Corrective Measure Implementation Report, addressing comments from EPA on draft submittals as provided for in Section X of the Order.

1. At the "completion" of the construction of the project, Respondent shall submit a Corrective Measure Implementation Report to EPA and Ecology. The Report shall document that the project is consistent with the design specifications, and that the corrective measure is performing adequately. The Report shall include, but not be limited to, the following elements:
 - a. Synopsis of the corrective measure(s) and certification of the design and construction;
 - b. Explanation of any modifications to the plans and why these were necessary for the project;
 - c. Listing of the criteria, established before the corrective measure was initiated, for judging the functioning of the corrective measure and also explaining any modification to these criteria;
 - d. Results of Facility monitoring, indicating that the corrective measure will meet or exceed the performance criteria; and
 - e. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report should include all of the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specification (with justifying documentation), and as-built drawings.

ATTACHMENT C

QUALITY ASSURANCE

1. Respondent shall develop a Quality Assurance Project Plan (QAPP), the primary purpose of which shall be to assist in planning for the collection and analysis of environmental samples in support of the Order and in explaining data anomalies. In general, the QAPP shall consist of the following:

1.1 Throughout all sample collection and analysis activities, Respondent shall use EPA approved quality assurance, quality control, and chain-of-custody procedures described in Interim Guidelines and Specifications For Preparing Quality Assurance Project Plans, QAMS-005/80, December 29, 1980. Respondent's QAPP shall be prepared in the format specified in QAMS-005/80. The following two references may be helpful in preparing the QAPP for this Order:

You and Quality Assurance in Region 10, EPA, Region 10 Quality & Data Management Program, March 1988.

Example Format and Critical Elements of Quality Assurance Project Plans, EPA, Region 10 Quality & Data Management Program.

1.2 The QAPP required under this Order shall include data quality objectives that are relevant to each data collection activity to ensure that data of known and appropriate quality are obtained and that data are sufficient to support their intended use(s). The QAPP shall include details on overall and specific data quality objectives, and descriptions of sampling, analyses and field measurements, including the following:

1.2.A. The Sampling section of the QAPP shall discuss:

- (i) Sampling methods including identification of sampling equipment, purging procedures, and decontamination procedures to be used;
- (ii) Criteria for determining the type of sampling (e.g., composites, grabs, discrete, continuous);
- (iii) Measures to be taken to prevent contamination of the sampling equipment and cross-contamination between sampling points;

- (iv) Selection of appropriate sample containers;
- (v) Sample preservation methods; and
- (vi) Chain-of-custody procedures.

1.2.B. The Analysis section of the QAPP shall include details regarding:

- (i) Holding times;
- (ii) Analytical detection and/or quantitation limits for each target compound;
- (iii) Analytical methods (unless otherwise approved in advance by EPA, methods shall be in accordance with Test Methods for Evaluating Solid Waste (SW-846), Third Edition, November 1986, or as updated);
- (iv) Type and number of quality assurance field samples appropriate;
- (v) Precision and accuracy requirements;
- (vi) Sample shipment requirements;
- (vii) Laboratory data delivery requirements; and
- (viii) The collection and analysis of quality assurance samples for each sampling event, such as field duplicates and matrix spiked samples and analysis of transfer blanks to identify sample contamination.

1.2.C. The Field Measurement section of the QAPP shall discuss documentation of field measurement operations and procedures, including procedures and forms for recording field data; calibration of field devices; collection of replicate measurements; potential interferences present; field equipment to be used; and decontamination procedures.

2. Respondent shall submit its QAPP to EPA at least seven (7) days prior to the initial environmental sampling event. EPA will not approve or disapprove of the QAPP, but Respondent will take into consideration any comments EPA may provide on the QAPP, and shall respond in writing if EPA so requests. Respondent shall amend the QAPP whenever there is a modification in the collection of samples, the analysis of samples, or whenever conditions or requirements of the QAPP change. Respondent may utilize the same QAPP or parts thereof for all sampling events to which it is applicable. Respondent shall submit addenda to the QAPP to expand its scope to include additional sampling events. Respondent may incorporate the QAPP and any addenda into any Workplan or report by reference.

3. The conditions and requirements specified in the QAPP shall meet all requirements of the Order. The terms and conditions in the QAPP shall be implemented.

4. The names, addresses, and telephone numbers of

analytical laboratories that Respondent intends to use must be specified in the QAPP.

5. Respondent shall monitor and ensure that high quality work is performed by its consultant(s) and its laboratory and contract laboratories. EPA may reject any data that does not meet the requirements of the Order or the applicable QAPP. This rejection of data may require that Respondent resample and reanalyze samples from the Facility.

6. A copy of the QAPP shall be retained at the Facility and shall be available to EPA upon request or inspection.

7. The director or manager of each laboratory providing measurement results in support of this Order and each QAPP must sign and submit to EPA with each submittal of laboratory-derived data, the following statement:

I certify these data are in compliance with all laboratory requirements of the QAPP for the Boeing Plant 2 Facility dated _____.

Signature: _____ Date: _____

8. Respondent shall obtain, or ensure its laboratories retain, the following documentation for sample analyses from the laboratories which conduct sample analyses in support of this Order, and will provide such documentation to EPA upon request:

- 8.1 All sample tracking reports (i.e., the signed chain-of-custody forms and the signed packing lists);
- 8.2 Sample log-in forms;
- 8.3 Air or freight bills;
- 8.4 Documentation of the condition of custody seals;
- 8.5 Any telephone logs referring to the samples;
- 8.6 Case Narrative signed by the laboratory manager or his/her designee certifying the accuracy and validity of all data reported and describing any changes or problems encountered during the analyses along with documenting their resolution(s);
- 8.7 Tabulated sample results, with units, percent solids, and sample weights or volumes clearly specified;
- 8.8 Blank data with tabulated results. Specify which samples go with which blanks;
- 8.9 Surrogate spike analysis result summaries with calculated percent recovery values;
- 8.10 Matrix spike/duplicate (MS/D) result summaries with calculated percent recovery and relative percent difference values.
- 8.11 All data system printouts and manual worksheets;
- 8.12 Raw QA data including:

- 8.12.A. Blank data in chronological order (tabulated results and blank data system printouts);
- 8.12.B. MS/D data in chronological order (tabulated results and MS/D data system printouts);
- 8.13 Extraction, dilution and cleanup logs and percent moisture for all samples, blanks, etc.;
- 8.14 Continuing calibration standards forms that include the lab name, lab code, job number, SDG number, calibration sources, concentration units, analytes, true values, found values and the calculated percent recovery;
- 8.15 The initial calibration curves, labeled with date and time of preparation;
- 8.16 Bench sheets for sample preparation and analysis of samples and standards indicating dates, times, methods of sample digestion/preparation and analysis, and volumes/amounts/concentrations of standard and reagents added, instrument run time/date, dilutions made, etc.; and preparation/weight logs for percent moisture determinations.

All bench sheets and logs are to be labeled with the date and bear the analyst's signature.

9. Respondent shall archive sample data and project records in accordance with the requirements of Section XIV: Records Preservation of this Order, unless such data and records are retained by the laboratory as provided herein. If Respondent's laboratory retains the required documentation in lieu of Respondent, Respondent shall verify at least annually that the required documentation can be retrieved from the laboratory upon Respondent's request. For data collected prior to completion of the CMS, the required documentation must be retained for at least six years after publication of a Final Decision and Response to Comments. For data collected subsequent to the CMS, the retention period shall be in accordance with Section XIV.

10. Respondent shall ensure that laboratories used by Respondent for analyses of samples obtained pursuant to this Order participate in a quality assurance/quality control (QA/QC) program which is substantively equivalent to that required by EPA for its contract laboratories (EPA Contract Laboratory Program). EPA may conduct a performance and quality assurance Technical Systems Audit of the laboratories chosen by Respondent before, during, or after sample analysis. Respondent shall approve or disapprove the laboratory's QA/QC program after obtaining and reviewing the Laboratory QA Plan and the Standard Operating Procedures (SOPs) which are used by the laboratory to measure samples from the Facility. Respondent shall ensure that all Laboratory QA Plans and SOPs address all applicable requirements of the Order and the QAPP, and all elements specified in the following EPA document: Guidance on Preparation of Laboratory

Quality Assurance Plans, U.S. EPA Region 10, EPA 910/9-92-032. Copies of the Laboratory QA Plan(s) and SOPs shall be made available to EPA upon request.

11. Respondent shall ensure that the laboratories used to measure samples for the Order have the facilities, equipment, staff, and QA Program and QC procedures to perform sample measurements in support of the Order and the QAPP. This may require that Respondent conduct an on-site Technical Systems Audit (as specified in QAMS 004/80 and in NPO and ORD QAPP Guidance, Quality Assurance Management Staff, U.S. EPA, September, 1987.) of the laboratories to make this determination.

12. As part of this Order and of Respondent's QAPP, and upon request of EPA, Respondent's laboratories shall perform analyses of Performance Evaluation (PE) samples provided by EPA to demonstrate the capability of the laboratory in meeting the data quality objectives as are specified in the approved Workplans and in the QAPP. EPA will attempt to coordinate provision of PE samples with regularly scheduled sampling events. The results of the measurement of these PE samples will be submitted to EPA upon request at no cost to EPA. EPA reserves the right to conduct at any time an on-site Technical Systems Audit, PE audit, or QA/QC audit of any laboratories chosen by Respondent to measure samples from the Facility.

13. A data validation report shall be prepared for each sampling event conducted pursuant to the requirements of this Order. Per the specifications (regarding the proportion of data to be validated) and the schedule in the approved Workplan, Respondent shall validate analytical data obtained, using U.S. EPA Functional Guidelines For the Validation of Organics and Inorganics Data. The data chosen for validation shall represent the entire range of values obtained. The data validation report shall be submitted to EPA in the periodic progress report following completion of data validation, or as required by the schedule in an EPA-approved Workplan.

ATTACHMENT D

DATA MANAGEMENT

1. Data Management Plan

Respondent shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and establish data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation. In general, the Data Management Plan should consist of the following:

1.1 Data Record

The data record shall include the following:

- a. Unique sample or field measurement code;
- b. Sampling or field measurement location including, when appropriate, surveyed horizontal coordinates and elevation of the sample location, and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Result of analysis (e.g., concentration);
- f. Elevations of reference points for all groundwater level measurements, including water level elevation, top of casing elevation, and ground surface elevation; and,
- g. Magnetic computer records of all ground water, soil, surface water, and sediment analytical data meeting the format specifications of the EPA Region 10 ground water data management system.

1.2 Tabular Displays

The following data shall be presented in tabular displays, as appropriate:

- a. Results for each medium and each constituent monitored;
- b. Data reduction for statistical analysis;
- c. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and,
- d. Data qualifiers.
- e. Summary data.

1.3 Graphical Displays

The objective of graphical displays of the data is to summarize the data and to indicate trends and to help to comprehensively analyze all data available. The following graphical formats may be appropriate for the data:

- a. Displays of sampling location and sampling grid;
- b. Identification of boundaries of sampling area and areas where more data are required;
- c. Displays of concentrations of contamination at each sampling location;
- d. Displays of geographical extent of contamination;
- e. Areal and vertical displays of contamination concentrations, concentration averages, and concentration maxima, including isoconcentration maps for contaminants found in environmental media at the Facility;
- f. Illustrations of changes in concentration in relation to distance from the source, time, depth, or other parameters;

- g. Identification of features affecting intramedia transport and identification of potential receptors;
- h. Maps showing the distribution of ground water head measurements in each aquifer at an appropriate scale and contour interval; and,
- i. For each well, a hydrograph that shows the distribution of water level measurements taken during the RFI for the time interval of the investigation.